

**A Clarification of the Use of Multiple Regression Analysis in Meeting the Burden of Proof in
Compensation Discrimination Litigation**

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**Thesis presented in partial fulfillment of the requirements for the degree of Master of
Commerce at the University of Stellenbosch**

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April 2005

DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

SUMMARY

The new set of employment equity laws call for South African organisations to justify their compensations systems. During compensation discrimination litigation, evidence is required to support arguments put before the court in order to meet the burden of proof. The similarity between foreign and domestic legal systems, suggests that the operational implications of foreign legislation will also be relevant to South Africa. This raises the debate as to the nature of fairness in the compensation context, the debate of comparable worth and the use of multiple regression analysis. The organisation must present to the court evidence to show that the choice of compensable constructs, their measurement and application does not discriminate directly or indirectly based on group membership. Multiple regression analysis, a statistical method to model the compensation system, is fraught with difficulties and misunderstanding. It is nevertheless the most appropriate method to investigate compensation fairness. Comparable worth and multiple regression analysis require assessment in the South African context. The issues, which hindered the successful use of multiple regression analysis abroad, are reviewed in order to smooth its entry into South African litigation. A framework is presented based on literature and case law whereby all parties concerned can produce and evaluate such evidence

OPSOMMING

Die nuwe Anti-Diskrimineringswetgewing verlang van Suid-Afrikaanse organisasies om salarisstelsels te regverdig. Gedurende salarisdiskriminasielitigasie word bewys verlang om die bewyslas oor te dra. Die gelyksoortigheid van buitelandse en binnelandse regstelsels gee te kenne dat die operatiewe implikasies van buitelandse wetgewing relevant tot Suid-Afrika sal wees. Dit bevraagteken die aard van billikheid in die kompensasieliteratuuressie konteks, die debat van vergelykbare waarde en die gebruik van veelvoudige regressieontleding. Die betrokke party moet bewys aan die hof toon om te bevestig dat die keuse van vergoedingskonstruksie, sowel as die meting en toepassing daarvan, nie onregverdig diskrimineer, ten opsigte van demografiese groepe nie. Veelvoudige regressieontleding 'n statistiese metode wat gebruik kan word om die salarissisteesem voor te stel. Alhoewel dit vele onduidelikhede bevat, is dit steeds die mees toepaslike metode om salarisbillikheid te ondersoek. Vergelykbare waarde en meervoudige regressieontleding is in die Suid-Afrikaanse konteks geëvalueer. Die aspekte wat die sukses van die gebruik van meervoudige regressieontleding in ander lande verhinder het, is ondersoek en geëvalueer om die toekomstige toepassing daarvan in Suid-Afrika te vergemaklik. 'n Raamwerk gebaseer op literatuur en gevallestudies word voorgestel, waar al die betrokke partye sodanige bewys kan produseer en evalueer.

ACKNOWLEDGEMENTS

My Supervisor, Mr Petrus Nel, for allowing me to make this thesis my own while never letting me feel like I was going it alone. I appreciate that your door was always open to me, where you were ready with words of calm. Because of this, your untouchable professionalism and humour when required, every day has been a pleasure writing for you. You are scholar and a gentleman, Sir.

My Co-Supervisor, Professor Callie Theron for his teachings over the years. I know that a Professor who means so much to all of his students, is a rare thing. Thank you for inspiring me and believing in me, and most importantly, teaching me how to think! It was a honour to be your student and privilege I will never forget.

Mr Graham Giles, for pushing me to contribute something meaningful. Without your enthusiasm, these pages would be blank.

Finally my family - for their love.

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CHAPTER 1: INTRODUCTION, RESEARCH OBJECTIVE AND OVERVIEW OF THE STUDY

1.1 INTRODUCTION

"Those who cannot remember the past are condemned to repeat it."

George Santayana

Organisations, in a free market, exist as risks taken by entrepreneurs who seek to make profit through the collaboration of people towards a common goal. The organisation constantly strives to maximise the ratio between outputs and inputs to become more efficient. Labour's combined effort allows labour to become specialised where success is dependant on the behaviour of people. It is the goal of the human resource function to add value by managing labour in a manner that contributes to the efficiency and effectiveness of the organisation. The role of the human resource function is to obtain the most suitable composition of labour with limited resources. Strategic interventions, aimed at influencing the flow and the composition or nature of the work force, affect the quantity and quality of labour available to achieve business goals. The success of the human resource function is evaluated in terms of efficiency and equity.

Equity refers to the fairness of both the procedures to reach decisions and the outcome of those decisions. Milkovich and Boudreau (1994) explained that while efficiency and equity are interrelated, they can sometimes be conflictual in nature. This implies that while an intervention is aimed at increasing the efficiency of the organisation, it may sometimes result in inequity. It is also the common view that equity is in practice necessary for the work force to be efficient (Lawler, 1981; Milkovich & Newman, 1993).

Equity is imposed upon the organisation by society *via* the presiding employment equity laws established by the state, which set principles to which the human resource manager must adhere. Forming part of the organisational environment, the legislation acts as the minimum standard, in terms of equity, to which organisations must abide. In this sense, the concept of effectiveness must be considered relative to- or in the context of equity in the organisation.

There lacks clarity as to what some South African equity legislation intends in operational terms and how the organisation is expected to abide with the laws. It is nevertheless required of the human

resource function to ensure that human resource management interventions are equitable and meet the given criteria, despite the fact that they are only broadly outlined in employment legislation. At this time, there lacks sufficient legal precedent by which the profession can justify an intervention as required by the Employment Equity Act (Republic of South Africa, 1998, p. 9). Exploration of the meaning of fairness in the compensation context and the operational terminology thereof is sought. Clarity on this issue is required for the human resource manager to find an objective position to assess organisational effectiveness.

Equity is difficult to achieve, evaluate and demonstrate, as it is a value-based concept. Consequently, there exists no single agreed upon definition of equity neither constitutively nor by way of operational denotation. During litigation proceedings, the above legislation places the onus of persuasion upon the human resource function to justify decisions by demonstrating that they are fair. It is understood that a justification of an intervention, in the legal process, requires certain evidence to meet the burden of proof placed upon the defendant. The nature of the onus, and arguably the nature of the evidence required to shift it, lies in the specifics of the legislation.

The human resource function is expected to meet those criteria outlined in the legislation, and furthermore, be in a position to justify interventions in terms of fairness by demonstrating their ability to deliver on those requirements. There is therefore a dire need for the human resource profession to obtain clarity of the nature of evidence required to establish and rebut a *prima facie* case of discrimination to avoid judgment. An opportunity also presents itself for employees, employers and the judicial system to gain different meanings from the same legislation. Herein resides another problem, in that legislation is subject to interpretation (Du Plessis, 1986). It is therefore important to understand various interpretations of legislation in order to develop evidence to as best as possible account for jurisprudence and if possible to premeditate possible judgments.

Eventually, legal precedent would provide the basis upon which compensation systems may be developed and evaluated. However, in the interests of good corporate governance and observance of the intentions of equity legislation, the human resource profession should not passively accept directives from the legal fraternity but actively help to constitute the nature of the required evidence. The human resource profession can ill afford to allow the legal profession to dictate what is required of the profession by building upon approaches to fairness through incautious precedent and ignorance. The rationale and manner of these interventions often dictate the manner in which they are justified. It

is therefore required of the field to become actively involved with such legal proceedings to better equip itself regarding the above.

Since 1994, South African society, has championed the cause of democracy, making concerted efforts to eradicate current discriminatory practices - and counteract the consequences of past discrimination. Under the banner of fairness, these initiatives permeate every aspect of mainstream society. South Africa continues to move away from rigid racial division by means of proactive employment equity practices. The Employment Equity Act (Republic of South Africa, 1998) defines “employment policy and practice” in broad terms. Section 6 of this Act forbids unfair discrimination, whether directly or indirectly, against any employee in any such employment policy or practice on one or more of the listed grounds.

The South African legal system is currently consumed with cases dealing in the concept of fairness as applied to dismissals. During this form of litigation, the question as to the nature of fairness and equity is raised albeit at a very rudimentary level. Discrimination litigation, as observed abroad, is growing in complexity and stature. This is particularly true in cases involving selection discrimination, which has evolved over the years to find a prominent place in the field of Industrial Psychology (Arvey & Faley, 1988; Casio, 1998; Gatewood & Feild, 1994; Muchinsky, 1997; Newel & Shackleton, 2000; Petersen & Novick, 1976). Here, the burden of persuasion has often required the profession, as defendant, to prove that differences in treatment (direct discrimination), or alternatively differences in impact (indirect discrimination) are not due to differences in group membership, but rather due to *bona fide* differences in inherent requirements of the job.

Although little literature exists to bridge selection discrimination thought, the same thinking is true of other interventions, particularly compensation (Note, 1975). Compensation as an employment practice, likewise, requires the justification. There lacks a definitive method by which unfair discrimination can be explored or demonstrated or by which it may be shown that what appears to be unfair discrimination, is in fact not. There is a possibility of adapting and transferring existing interpretations and evaluations of unfair selection discrimination operational procedures to compensation discrimination litigation. This seems to be the next avenue of exploration in discrimination litigation possibly due to its similar affective connotations and considerable impact on people’s lives. Evidently, the trend of accountability will spread to South Africa in the wake of globalisation and the spread of international management and union practices (Bendix, 2001). It is understood that the South African legal system will soon apply concepts of fairness to compensation.

In keeping with this, human resource interventions, in light of the legal framework, will be under scrutiny by employees and must therefore also be of a nature or possess characteristics, which will meet the burden of proof.

Section 27 Employment Equity Act (Republic of South Africa, 1998, p. 15) states:

Every designated employer, when reporting in terms of section 21(1) and (2), must submit a statement as prescribed to the Employment Conditions Commission established by Section 59 of the Basic Conditions of Employment Act, on the remuneration and benefits received in each occupational category and level of that employer's workforce.

Subsection (a) of this section reads:

Where disproportionate income differentials are reflected in the statement contemplated in subsection (1), a designated employer must take measures to progressively reduce such differentials subject to such guidance as may be given from the Minister in subsection (4).

Disproportionate differentials refer to discrepancies, which cannot be adequately accounted for in terms of legally acceptable grounds. Unaccountable remaining differentials may be claimed as *prima facie* evidence of unfair discrimination.

Section 29 of the Promotion of Equality and Prevention of Unfair discrimination Act (Republic of South Africa, 2000) refers to the illegal perpetuation of disproportionate income differentials and mentions the principle of equal pay for equal work. The relationship between two above mentioned legislations and the Labour Relations Act (Republic of South Africa, 1995) is however unclear.

As the basis of a compensation system, job evaluation systems and performance measurements serve as the measurement tools of worth, while fairness is judged on the relation of these measurement to the final monetary outcome, that is, the inference made from the tool to determine compensation level. Unfairness could be inferred if two jobs are equal or comparable, in worth, but are ascribed different levels of compensation. Herein lies room for the fairness debate concerning the nature of unjustifiable differences in pay. In practice, numerous factors understandably effect the remuneration of a job incumbent and legislation requires that compensation be fair and justifiable. To date there is no South African precedent establishing neither a favoured operational definition of fairness nor implication of the evidence required to vindicate a compensation system.

Experience in dealing with these concepts abroad is important for the understanding and application during the interim, as has been is the case with many legal adoptions. In order to aid the establishment of precedent, South African judges are permitted to refer to international precedent. Similarly, this is

true of those preparing to meet the burden. On exploration, one finds that American and Canadian organisations have dealt extensively with pay discrimination, reporting the use of multiple regression analysis, to investigate the fairness of compensation differentials. Both countries have encountered the related issue of comparable worth. The American experience is dominated by litigation, Bazemore versus Friday (1986) being the seminal case, while the Canadian experience is dominated by public sector initiatives (Gunderson 1994a).

The American courts' findings have at times been favourable to the defendant while on other occasions the verdict has been for the plaintiff depending on the type and various features of statistical evidence. While legal systems might differ, the nature of evidence required is arguably similar. The type of legislation aimed at non-discriminatory labour practices, which South Africa has incepted since 1994, inclines itself toward the use of statistical proofs among which, multiple regression analysis seems to be the most useful method, at least in terms of the experience of American and Canadian courts (Gunderson, 1994a; Harris & Suszko, 2004). One may presume that multiple regression analysis would also be used in South Africa as evidence in litigation. Multiple regression analysis is however subject to certain vulnerabilities which have been subject to misunderstanding and both malicious or inadvertent exploitation (Barrett, Alexander, Anesgart, & Doverspike, 1986; Barrett & Sansonetti, 1988; Fisher, 1986; Harris & Suszko, 2004.) In anticipation of the exploitation of statistical evidence becoming prevalent in South Africa, a best practice method is required for the presentation of regression evidence in the compensation context.

A technique is required to justify differences in compensation in a court of law. Should South African human resource practitioners fail to take a proactive step towards conceptualising the manner by which interventions may be justified, the situation may arise where it is practically impossible to fulfill their role in society and the organisation as stipulations set by those outside the profession are often illogical and impractical in the business world. The profession should embrace the spirit in which legislation has been written. The requirements laid down by the legislation spells the end of whimsical decision making on the part of the human resource profession, together with a higher value for the scientifically minded human resource practitioner in the marketplace. There is a need to explore the implication of the burden of proof to human resource profession. The profession now has an opportunity to grow and strengthen its role in society through proactive initiatives.

1.2 RESEARCH OBJECTIVES

"All paths lead to the same goal: to convey what we are."

Pablo Neruda

As no South African precedent exists by which to defend a compensation system against allegations of discrimination, this thesis envisages a best practice framework to justify compensation differentials and offer basis upon which the judicial system evaluate the presentation of evidence. In order to do this, two central issues must be clarified.

Chapter 3, section 13 of the Promotion of Equality and Prevention of Unfair Discrimination Act (Republic of South Africa, 2000, p. 7) reads:

- (1) If the complainant makes out a prima facie case of discrimination—
 - (a) the respondent must prove, on the facts before the court, that the discrimination did not take place as alleged; or
 - (b) the respondent must prove that the conduct is not based on one or more of the prohibited grounds.
- (2) If the discrimination did take place—
 - (a) on a ground in paragraph (a) of the definition of “prohibited grounds”, then it is unfair, unless the respondent proves that the discrimination is fair;
 - (b) on a ground in paragraph (b) of the definition of “prohibited grounds”, then it is unfair—
 - (i) if one or more of the conditions set out in paragraph (b) of the definition of “prohibited grounds” is established; and
 - (ii) unless the respondent proves that the discrimination is fair.

The Employment Equity Act (Republic of South Africa, 1998, p. 9) also makes reference to the burden of proof stating, “Whenever unfair discrimination is alleged in terms of this Act, the employer against whom the allegation is made must establish that it is fair.”

Firstly, the burden of proof resting on both applicant and defendant, referred to above, requires clarification in the compensation context.

Secondly, a review of the use of regression analysis, as used in American litigation is required. An evaluation of evidence is required for operational and litigation purposes, befitting the requirements of the South African Employment Equity Act (Republic of South Africa, 1998) and the Promotion of

Equality and Prevention of Unfair Discrimination Act (Republic of South Africa, 2000). More specifically this second objective of the research is to:

- Adapt and translate the classical regression-based interpretation of selection fairness to compensation fairness;
- To describe an operational procedure in terms of which the fairness of a compensation system could be evaluated;
- To identify potential methodological vulnerabilities in the proposed procedure;
- To illustrate the application of the multiple regression-based procedure on a simulated data set

CHAPTER 2: A THEORETICAL ANALYSIS OF COMPENSATION FAIRNESS

2.1 COMPENSATION FRAMEWORK

“When a man says he wants to work, what he means is that he wants wages.”

Richard Whately

The foremost reasons for the establishment of an organisation are the increased productivity and efficiency gains owing to the cooperative efforts of individuals. The collective nature of an organisation allows individuals to focus expertise and specialise in allocated work. Due to the division of labour, organisations comprise a number of jobs, grouped into a variety of positions. Each position represents a unique combination of characteristic tasks, roles and duties.

The labour required by organisations is determined by the respective job specifications. A job specification refers to the competencies deemed necessary to meet the requirements of a particular position (Carrell *et al.*, 1998). The organisation seeks a match between the requisite tasks, roles, and duties of the position, with the type or level of skills, abilities and knowledge necessary to be successful in the position. Labour combines with other factors of production to affect organisational goals upon which a certain value is derived due a job incumbent’s successful contribution in a specific position.

Buyers and sellers of labour, meet in the labour market to establish the value of competencies by way of demand and supply. In doing so, an evaluation of worth, is attributed to the respective types or levels of skills, abilities and knowledge. The labour is bartered upon at an agreed upon value. The exchange of labour is not permanent, as labour differs from other factors of production in that it cannot be bought and sold. Labour is essentially hired or rented from an individual, as a service offered to the employer (Mohr & Fourie, 1995).

The intrinsically heterogeneous nature of labour in terms of the many different types or levels of competencies, and combinations thereof, have two implications for the determination of the value of labour. Firstly, the labour market is composed of a variety of smaller labour markets each concerned with the exchange of a specific form of labour and secondly, unlike goods or services, labour cannot be

classified or standardised, as there is no inherent or universal value of labour (Mohr & Fourie, 1995; Rees, 1979).

Many different factors affect the price at which the individual is willing to work and the price at which the employer is prepared to procure labour. Firstly, labour is usually employed by way of a long-term contract, and therefore, in most cases, the price of labour is not continuously renegotiated. Secondly, the price of labour is also affected indirectly by factors not related to the supply and demand, for example taxation. There are many non-monetary factors, which also affect the price of labour by way of supply and demand, for example, the location and working conditions. Thirdly, due to the imperfect functioning of the labour market, considerations other than material advantage enter the relationship. Non-economic, largely societal factors such as equity, loyalty, fairness, appreciation and justice influence the functioning of the labour market (Mohr & Fourie, 1995; Rees, 1979).

A change in the quantity of labour demanded or supplied affects the market's evaluation of the labour's worth. The value of the labour may be transcribed to the compensation package comprised of the salary/wage rate and non-wage benefits of employment. The compensation package therefore attempts to serve as parity between the efforts expended by the individual, as a function of the value of the competencies and the relative value of the labour accrued to the organisation. The performance of an employee in a particular job is the ultimate compensable factor and many proxy measure are used to operationalised this very comprehensive and multifaceted construct. As it is performance that contributes value to the organisation, it is ultimately the level of performance which should be compensated.

Organisations and individuals in a labour market are influenced by a complex combination of other factors, which have a bearing upon the level of compensation an organisation would pay for labour as compensation also serves many roles and purposes for both parties. The labour market deals with people's hopes, fears and ambitions; political, social and ethical consideration; and as a result wage determination has both an economic and non-economic dimension.

2.1.1 Compensation System

The workforce is arranged within the organisation in categories by means of a job evaluation system. Each job is assessed by factors such as skill, responsibility and physical effort. Jobs with similar scores are often graded into job ranks, resulting in an organisational hierarchy. The compensation

system is based on two variables, according to Gerber and van Dyk (1998), namely input and outcome. The goal of the compensation system is to return value to the individual for the input into the organisation, from which the organisation accrued an outcome.

Differentials exist in the level of compensation and the type, timing and nature of the compensation. The compensation system forms part of a strategic framework integrating with other human resource systems and interventions aimed at the effective and efficient application of labour toward organisational goals. An effective compensation system is therefore aimed at effecting organisational goals at the lowest possible cost. A strategic compensation system accounts for the possible influence of all influencing factors, both internal and external to the organisation. A compensation system as a strategic management tool aids the organisation's weaknesses and builds upon its strengths adapting to an ever-changing labour market. Strategic compensation systems are viewed as successfully balancing consistency, competitiveness, rewarding employee contributions and minimising administration while complying with legislation (Hills, Bergmann, Scarpello, 1994; Hume, 1995; Milkovich & Newman, 1993).

2.1.2 The Reward Package

Although the term compensation is often used interchangeably with wage and salary administration, it is a more comprehensive term referring to both extrinsic, (external and secondary) to the job and intrinsic (built in) rewards within the job. Compensation may therefore be defined broadly as "what employees receive in exchange for their contribution to the organisation" (Dyer, Schwab & Fossum in Carrell *et al.*, 1998, p. 370). Figure 1 lists general types of extrinsic and intrinsic compensation.

The compensation system prescribes a package of extrinsic rewards, to compliment rewards intrinsic to the job. As different offers of compensation are made to employees performing different jobs, a problem is created in making comparisons in the different combination of benefits. While some benefits may remain fixed across the organisation or increase with job grade, the problem arises in comparing benefits that are not easily converted into a monetary value.

Although it is sometimes possible to factor intrinsic rewards into the evaluation of the system, the functioning of the labour market implies that all non-pecuniary rewards influences the pecuniary rewards as employees compare intrinsic and extrinsic rewards, as discussed below, before rendering their labour at the given monetary value. That is, the higher the intrinsic reward, the lower the

extrinsic reward may be, to attract and procure labour and *visa versa*. Therefore, the labour market includes the effect of the levels of intrinsic reward in determining the level extrinsic rewards. However, this conclusion is based on the assumption of a perfect labour market. While this assumption may not be true for job seekers, a claim of compensation discrimination is usually alleged by job incumbents, familiar with the work content.

According to Conway and Roberts (1983), the consideration of both forms of income, pecuniary (financial) and non-pecuniary (non-financial) rewards are desirable in a comprehensive study of discrimination. It is likely that discrimination could be concealed should the latter non-financial rewards fail to be considered. This would imply that the types of rewards listed under benefits in Figure 1 should be, where possible, included in the comparison. Alternatively, it may also be argued that the inclusion of intrinsic factors into the financial rewards and benefits required to induce labour into the market place, is indeed fortunate, as intrinsic reward of a particular job is a subjective issue, therefore indeterminate, unsuitable as evidence and unable to be accurately factored into statistical evidence. The issue of intrinsic rewards should only become important to litigation should their exclusion change the courts evaluation of fair outcome. Following this, litigants would do well to attempt to account for intrinsic rewards, as there is theoretical evidence to suggest that intrinsic factors are the more powerful motivators in the job, and therefore more likely to be the origin of dispute (Bergh & Theron, 2003; Lawler, 1981).

Although parties are afforded legal representation, the human resource manager is responsible for the generation and possibly the presentation of evidence. It is therefore necessary that the human resource profession should be aware and prepared for the legal ramifications of interventions and possible directions unions may take during litigation. The manager should be clear as to employment equity legislation, the benchmark evidence required to demonstrate the compliance of the system and as case law evolves, the tolerance of the court to various issues which may arise. Furthermore, the profession must be actively involved in explicating and clarifying the operational implications of legislation by actively contributing to the process of growing precedent. Eventually clarity shall be gained on what comprises unsound or successful evidence. It could also benefit prudence to work backwards, from successful evidence to the design of the organisation's compensation system. In other words, it could be maintained that the compensation must be operated on the grounds of what type of evidence is required to furnish successful evidence.

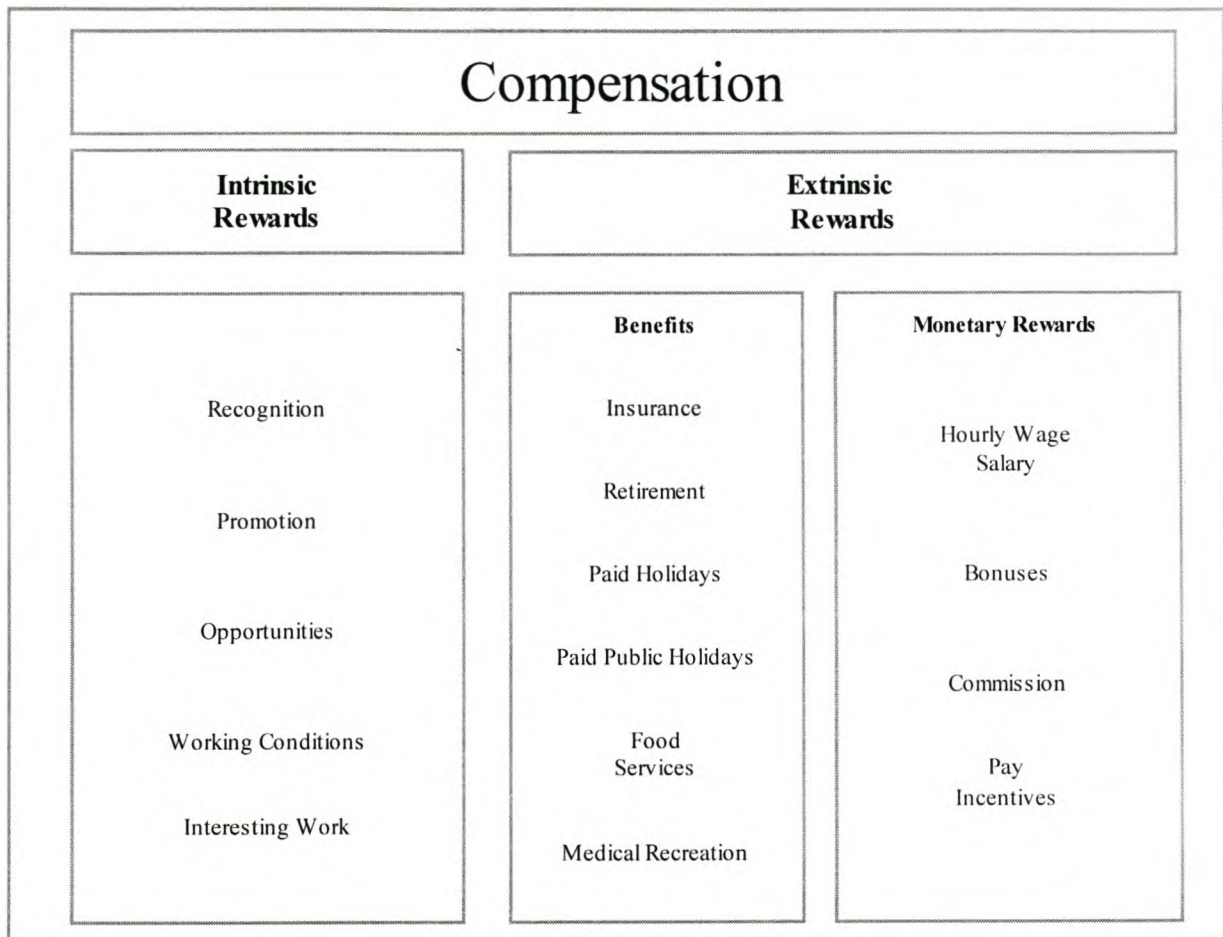


Figure 1: The Total Compensation System (Carrell, Grobler, Elbert, Marx, Hatfield & van der Schyf, 1998, p. 371).

2.2 EMPLOYMENT EQUITY LEGISLATION

“All animals are created equal, but some animals are created more equal than others.”

George Orwell

Compensation inequity comprises two distinct aspects: The first refers to the presence of unfair discrimination in compensation systems and the second refers to the adverse impact caused by legitimate, fair compensation practices, namely the manifestation of a wage gap. Employment equity legislation approaches these accordingly by not only dealing with the prohibition of unfair discrimination, but also drawing upon affirmative action measures in an attempt to repair yesterday’s societal imbalances. The Employment Equity Act (Republic of South Africa, 1998) prescribes the implementation of affirmative action measures to redress the compensation disadvantages experienced by designated groups, in order to ensure their equitable representation in all occupational categories and levels in the workforce. The above Act defines designated group to mean black people, women and people with disabilities (Republic of South Africa, 1998).

Although unfair discrimination in compensation has caused adverse impact, the removal of unfair compensation discrimination only succeeds at maintaining the *status quo*. Employment Equity legislation would therefore fail to meet its objective if it failed to address the inequality caused by past unfair discrimination in other employment practices and by the lack of opportunity afforded by Apartheid to members of the protected groups. Likewise, affirmative action measures would be ineffective should unfair discrimination remain and would “fight a losing battle.” The manner in which compensation discrimination is addressed affects the nature of the wage gap. Although the two pillars of employment equity practices are related, the demonstration of fair compensation practices however, does not involve affirmative action measures. Rather, compensation discrimination litigation, the concern of this thesis, concerns dispute arising from an alleged failure to remove unfair discrimination from employment policies and practices.

2.2.1 South African Legislation

South Africans take much pride in a strong Constitution and their ability to abide by it. Employment equity legislation gives voice to Section 9 of the Constitution, which defines the right to equality in subsection 3 and 4 (Republic of South Africa, 1996, p. 3):

The state may not unfairly discriminate against anyone, directly or indirectly, on one or more of the following in grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth.

No person may unfairly discriminate directly or indirectly against anyone on one or more grounds in terms of subsection (3). National legislation must be enacted to prevent or prohibit unfair discrimination.

Three central pieces of legislation guide this endeavour. The Employment Equity Act (Republic of South Africa, 1998), the Chapter 2 of Promotion of Equality and Prevention of Unfair Discrimination Act (Republic of South Africa, 2000), and the Labour Relations Act (Republic of South Africa, 1995) all echo similar sentiments regarding the prohibition of unfair discrimination. Each legislation however; provides a different emphasis on the concept of fairness.

2.2.1.1 The Employment Equity Act

The Employment Equity Act (Republic of South Africa, 1998) aims to achieve equity in the workplace by promoting equal opportunity and fair treatment in employment practices through the elimination of unfair discrimination. The Employment Equity Act (Republic of South Africa, 1998) defines

“employment policy and practice” by listing management practices, among which are job classification and grading, performance evaluation systems, remuneration and employment benefits. Section 6 of this Act forbids unfair discrimination in employment policies and practices, whether directly or indirectly, against any employee in any such employment policy or practice on one or more of the listed grounds. Illegal discrimination may be ascribed to malicious discrimination, which is preventable and not required in the operations of a business (Botha, 2000).

Direct unfair discrimination is based on arbitrary factors not pertaining to the job requirements. An example of this, are social attitudes which once excused the lower payment of women (Mahoney, 1983).

Indirect unfair discrimination, however, is subtle and only revealed upon statistical analysis of employment practices. An employer's policy or application of a measuring instrument may have an unintentional disproportionately negative effect on a group, which cannot be justified in terms of business necessity. It is realised that “a neutral employment policy may still have a discriminatory effect if applied to racial classes not similarly situated with respect to a policy” (Norris, 1983, p. 734).

Cascio (1998, p. 14) defined this form of discrimination as occurring “when identical standards or procedures are applied to everyone, despite the fact that they lead to a substantial difference in employment outcomes for members of a particular group, and they are unrelated to success on a job.” Perhaps this definition, in some cases, could be expanded to include standards and procedures related to success which when applied affects population groups disproportionately, and their inclusion is unreasonable or having a negligible effect on success. A prime example is the gratuitous compensation of employees for skills, which the majority of members from a population subgroup do not possess. Subgroup refers to any delineation between members of society based upon personal characteristic for example race, language, HIV or marital status. Mahoney (1983) added that jobs might be stereotyped as work dominated by a particular by a particular gender. Bias may then be incorporated into wage structures and in the job evaluation systems. This perpetuates bias against female dominated occupations, (an argument of comparable worth theorists). An example of indirect discrimination against groups was given by England (1992), where war veteran status discriminates against women, as more men have been veterans or fought in World War II. In *Griggs versus Duke Power Company* (1971), one of the seminal indirect discrimination cases, the Power company’s failing to prove that educational credential was business related (an inherent requirement of the job), showed that the application of the selection criteria indirectly discriminated against less educated black candidates.

The Employment Equity Act (Republic of South Africa, 1998) also refers to the concept of proportionate pay, which will be introduced later in this section.

2.2.1.2 The Promotion of Equality and Prevention of Unfair Discrimination Act

The Promotion of Equality and Prevention of Unfair discrimination Act (Republic of South Africa, 2000), defines discrimination as any act or omission, including a policy, law, rule, practice, condition or situation which directly or indirectly (a) imposes burdens, obligations or disadvantage on; or (b) withholds benefits, opportunities or advantages from, any person on one or more of the prohibited grounds. It is worth noting that the Act (Republic of South Africa, 2000) equates discrimination, with adverse impact, discrimination is not tantamount to unfair discrimination. Both fair and unfair discrimination are capable of resulting in adverse impact. Chapter three of the Act refers to *de jure* and *de facto* equality. In terms of this clause, equality is evaluated in terms of outcome. Chapter Three, subsection 14(2) reads (Republic of South Africa, 2000, p. 7):

In determining whether the respondent has proved that the discrimination is fair, the following must be taken into account:

- (a) The context;
- (b) the factors referred to in subsection (3);
- (c) whether the discrimination reasonably and justifiably differentiates between persons according to objectively determinable criteria, intrinsic to the activity concerned.

Subsection 14(3) reads (Republic of South Africa, 2000, p. 7):

The factors referred to in subsection (2)(b) include the following:

- (a) Whether the discrimination impairs or is likely to impair human dignity;
- (b) the impact or likely impact of the discrimination on the complainant;
- (c) the position of the complainant in society and whether he or she suffers from patterns of disadvantage or belongs to a group that suffers from such patterns of disadvantage;
- (d) the nature and extent of the discrimination;
- (e) whether the discrimination is systemic in nature;
- (f) whether the discrimination has a legitimate purpose;
- (g) whether and to what extent the discrimination achieves its purpose;
- (h) whether there are less restrictive and less disadvantageous means to achieve the purpose;
- (i) whether and to what extent the respondent has taken such steps as being reasonable in the circumstances to—
 - (i) address the disadvantage which arises from or is related to one or more

- of the prohibited grounds; or
- (ii) accommodate diversity.

Of particular relevance to the compensation context firstly, is whether discrimination is legitimate in purpose, linked to business related grounds. Secondly, the mention of systemic unfairness befits the approach of statistical evidence and thirdly, that fairness is evaluated in terms of context. These points have important ramifications on the litigation process; the type of evidence that would show compliance with legislation and the approach the courts will take to evaluating compensation fairness.

2.2.1.3 The Labour Relations Act

The Labour Relations Act (Republic of South Africa, 1995) focuses on unfairness in the context of dismissals. Other forms of discrimination, on the grounds such as sex, race, and age are treated as residual unfair labour practice in terms of item 2(1)(a) of schedule 7 to the Act. The definition of a residual unfair labour practice is included in the Act, as any unfair practice or omission which arises between employer and employee and which involves among others, of the following:

- Unfair discrimination
- Unreasonable behaviour on the part of the employer as regards the promotion, demotion, grading or training of an employee or the granting of benefits to an employee

Grogan (1996), a noted expert in South African labour law commented on the central role unfair labour practices play in the Labour Relations Act (Republic of South Africa, 1995). According to this commentary, the Act attempted to codify unfair labour practices jurisprudence in order to reduce the subjectivity and unpredictability of judgments. However, the legislation is only prescriptive in some areas of fairness leaving a wide array of labour practices to be governed by Schedule 7 of the Act under the heading of residual unfair labour practices. Bendix (2001) claimed that the definition greatly limited the scope of unfair discrimination, failing to codify certain possible forms of unfair labour practices. The item however did make particular mention to job evaluation.

Grogan (1996) concluded that this concept will add a number of disputes and employers must therefore review their policies on many of the issues, which are largely at their discretion. In particular, it was suggested that Schedule 7 of the Labour Relations Act (Republic of South Africa, 1995) would serve as a launching pad for some innovative actions. This thesis ventures the most plausible of these,

namely, multiple regression analysis in the compensation context, as has been in the case of foreign legislations.

Although this Schedule has been repealed by the more comprehensive Employment Equity Act (Republic of South Africa, 1998), the spirit of the original schedule (and conceivably the manner in which it was interpreted,) remains unchanged in subsequent versions. Moreover, South Africa's seminal compensation discrimination case (and only such Labour Court case under the new legal dispensation), *Louw versus Golden Arrow Bus Services* (2000), based its rulings upon this schedule setting important precedent. Although the applicant in this case did not claim the systematic discrimination, in the compensation system as such, Judge Landman traversed many related issues; affording future cases an important starting block from which to evaluate the concept of compensation fairness.

2.2.2 Foreign Legal Legislations

In the following section American, Canadian and the United Kingdom's statutes are paralleled with their South African counterparts, in order to suggest similarities among the various legislations. Foreign experience has a bearing to the route South Africa may follow in dealing with compensation discrimination, and the meaning that will be ascribed to the new South African legislation. The comparison between legal systems is meaningful and valuable, due the emergence of global trends and the trend of convergence of legal systems to meet rapidly changing environments (De Cruz, 1999). Of particular importance is the manner in which these countries dealt with employment equity issues and derived operational implications. To this end, evidence that convinced courts abroad, most likely would also be deemed acceptable by South African courts.

2.2.2.1 American Legislation

The American Equal Pay Act (United States Congress, 1963) concerns cases of pay differential among employees of different sex within the same job. In an equal pay case the defendant attempts to prove the jobs dissimilar while the plaintiff presents evidence to prove the respective jobs identical. The view that a subsequent amendment to this act does not require the jobs to be equal led to the controversial issue of comparable worth (Cooper & Barrett, 1984). Title VII of the American Civil Rights Act (United States Congress, 1964) was designed to eliminate employment discrimination

barring discrimination on grounds of race, colour, religion, sex or national origin, and endeavoured to address the controversy surrounding comparable worth (Norris, 1983).

2.2.2.2 Canadian Legislation

While comparable worth was first introduced and applied in United States, according to Gunderson (1994a), it is currently regarded as “put on ice”. The Canadian province of Ontario has dealt with issues of comparable worth more extensively, since the inception of the Ontario Pay Equity Act (Revised Statutes of Canada, 1988). Canadian legislation requires proportionate pay for work of proportionate value if jobs of equal value or proxy jobs are not present for comparison. That is, legislation supports comparable worth. Classification of whether a job is male or female dominated, changes over jurisdictions.

Ontario has also made provisions which allows the gender dominance of a job to be determined by historical factors as well as the gender stereotype of the work content, to prevent employers from shifting the job categories so as to reduce the number of gender dominated jobs and thereby to restrict comparisons and wage adjustments. Most of the Canadian jurisdictions have implemented comparable worth programmes. While remaining in the public sector, with the exception of Ontario whose initiatives involve the private sector as well. Canada leads the world in both sophistication and legislative bearing (Pinder, 1998; Gunderson 1994a). Employers are requested by this act to compare female-dominated jobs with male-dominated jobs within the same bargaining unit.

The South African Employment Equity Act (Republic of South Africa, 1998) resonates with the Canadian Employment Equity Act (Revised Statutes of Canada, 1995) and is similarly structured. Part I, section 5 of the Canadian Employment Equity Act (Revised Statutes of Canada, 1995) reads:

Every employer shall implement employment equity by (a) identifying and eliminating employment barriers against persons in designated groups that result from the employer's employment systems, policies and practices that are not authorized by law; and (b) instituting such positive policies and practices and making such reasonable accommodations as will ensure that persons in designated groups achieve a degree of representation in each occupational group in the employer's workforce that reflects their representation in...

Pinder (1998), and Milkovich and Newman (1993), reported the slow implementation of practices aimed at pay equity. The was due to the complex and vague nature of Ontarian law requesting the proof of equal value and the comparison of worth between jobs, a definition based on arbitrary

standards and idiosyncratic views of what constitutes worth. The Canadian experience forebodes a period of uncertainty for South Africa

2.2.2.3 The United Kingdom's Legislation

The Equal Pay Act (Equal Opportunities Commission, 2004a) since its inception in 1970 with subsequent amendments in 1983, and the revised Sex Discrimination Act (Equal Opportunities Commission, 2004b) have breathed new life into anti-discrimination practices under the Labour Government. The Equal Pay Commission has afforded employers information and time to rectify compensation disparities. Section 1 subsection 5 of the Equal Pay Act (Equal Opportunities Commission, 2004a, p. 3) reads:

A woman is to be regarded as employed on work rated as equivalent with that of any men if, but only if, her job and their job have been given an equal value, in terms of the demand made on a worker under various headings (for instance effort, skill, decision), on a study undertaken with a view to evaluating in those terms the jobs to be done by all or any of the employees in an undertaking or group of undertakings, or would have been given an equal value but for the evaluation being made on a system setting different values for men and women on the same demand under any heading.

Agencies have accumulated much knowledge on the matter, however progress has been hampered by widespread deregulations and abolition of wage counsels under Conservative government from 1979 to 1997 (Gregory, Sales & Hegewisch, 1999). The British prime minister recently acknowledged that "Equal pay [between genders] is not a reality but an aspiration for millions of women" and has laid out the pursuit of compensation equity, as part of the vision for- and high on the agenda of the Labour government (Blair, Trade Union Congress Speech, September 13, 2004.) Trade unions have become aware of the importance and need to challenge pay systems, and have focussed their litigation strategies, endeavouring to clarify important points of law. Gregory *et al.*, (1999) reported that the focused strategies of labour unions in the United Kingdom have resulted in important recent victories in favour of comparable worth.

2.2.3 Proportional Pay: An Implication of the new Legislation

As mentioned above, it may be argued that the implications of similar foreign legislations, and their approaches to fairness, may raise similar debates in South Africa. Section 27 of the Employment Equity Act (Republic of South Africa, 1998) requires every designated employer to submit a statement of the remuneration and benefits received in each occupation category or level in the workforce.

Where disproportionate differentials are reflected between job levels, measures must be taken to reduce such differentials.

The first implication of this section explicitly requires that the employer reduce income differentials progressively, subject to guidelines published by the Minister of Labour, according to which the employer is required to reduce the pay ratio between the highest paid employees and the lowest paid employees (Botha, 2000).

The second implication is less direct, but when considered in the context and spirit of other legislations, and foreign legal systems; the mentioned of proportionality between job grades, could be interpreted to entail the concept of comparable worth. While equal value for equal work is protected under the Act, the legislation does not mention a requirement for justifiable differentials between comparable jobs. The legislation does however, require organisations to justify the compensation differential between job levels stating the difference is required to be proportionate. Proportionality involves an element of balance and fairness. The legislation does not directly imply that the jobs must be proportionate to the determined compensation, but that the difference value between the levels on a grading system is proportionate. The legislation does not require differences in value between job levels to be equal, but that a relation or ratio of value, between job levels is consistent with the relation or ratio between job levels (conceivably in terms job worth). However in order to determine whether the value is proportionate, it is first necessary to determine to compare the job levels. Much depends on how the job content is grouped into jobs, and on what intervals the job are graded into levels. Any amount of pay discrimination can be concealed by how the work content is divided and arranged in the organisation. By failing to compare job content, the Act fails to meet its objective. In the spirit of the legislation, organisations must make comparisons between jobs in order to compare the values ascribed. Herein lies room for the debate concerning the nature of justifiable differences in pay, as the above argument bares Section 27 to require a comparable worth approach.

The specifics of legislation in legal systems such as United States, Canada and Australia directly, among others, for the purposes of employment equity practices, directly or indirectly expect the comparison of jobs across organisational departments, organisations and occupations to determine the relative worth of jobs. American litigation dealing with this legislation has borne and dealt with the controversial issue of comparable worth (American Federation of State, County and Municipal Employees versus the State of Washington, 1985; Gunther versus County of Washington, 1981;

Spaulding versus University of Washington, 1984). The issue of comparable worth has led to much debate, and a definite solution to the problems it presents has not been reached.

Although not explicit any form of domestic or foreign legislation, the various legislations implicate similar practices to those described above. This requires human resource managers, labour economists and the legal fraternity to reconsider the rationale of comparable worth theory and its application in South Africa, especially in terms of the dire need to prevent the exacerbation of the wage gap.

Wage discrimination litigation, as observed abroad, is growing in complexity and stature. As has been the case with many legal adoptions, experience in dealing with concepts abroad is important for the understanding and application in South Africa. Prevailing South African labour law is founded upon these foreign legal systems. The similarities between the respective sets of legislation serve as the basis by which foreign case law and literature becomes valuable to the implications of South African legislation and litigation procedures. Canadian legislation served as the basis for the drawing up of the South African legislation, which places the Canadian experience, and implementation of their legislation, as an indicator to the route South Africa could take in the future. Similarly, extensive American litigation has afforded this new legislative framework valuable practical experience to draw upon. In these situations, South African judges are permitted to refer to international precedent. Judges are grateful when legal representation assists the court process by researching and submitting foreign precedent where none exists, as was Judge Landman in *Louw versus Golden Arrow Bus Services* (Landman, 2000).

2.3 TOWARD A CONCEPT OF COMPENSATION FAIRNESS

“Expecting the world to treat you fairly because you are a good person is a little like expecting the bull not to attack you because you are a vegetarian.”

Dennis Wholey

Fairness has been accompanied with many synonyms, nuance and approaches over the world. Before attempting to build evidence to prove compensation fairness, which will meet the burden of proof, it is necessary to develop an appreciation of fairness, as a multifaceted concept. This requires awareness of its principles and scope. Following a general discussion on the nature of fairness and its interrelated concepts, two perspectives on compensation fairness are presented: Firstly, the more narrow and conventional application of fairness which seeks equal compensation for similar employees carrying out similar jobs (Cooper & Barrett, 1984). Secondly, this above “equal pay for equal work” approach

is expanded to introduce the widely debated comparable worth theory or equal pay for equal worth (Browne & Giampetro, 1987; England, 1992; Lavan, Katz, Malloy, & Stonebraker, 1987; Mahoney, 1983). Comparable worth theory which seeks the establishment of fairness in compensation between jobs of differing work content, where unfairness is inferred when job content which is dominated by one group, is valued differently (or compensated differently) to the job content dominated by another group (England, 1992). According to comparable worth theory, this should constitute a *prima facie* case of discrimination. That is, two perspectives on compensation fairness, stated casually; fairness between people; and fairness between jobs. The terms comparable worth, compensation fairness and pay equity are interchangeable terms in much of the literature (Gunderson, 1994a; Wooden, 1999b). The term comparable worth tends to be used in the United States, while pay equity refers to the same concept in Canada (England, 1992; Milkovich & Newman, 1994; Pinder, 1998).

Regardless of approach, equity legislation seeks social justice. The fundamental principle underlying fair compensation, is fair and just discrimination. As noted by Conway and Roberts (1983), fairness and discrimination are interrelated concepts, where fairness is observed in terms of discrimination. Legislation requires the organisation to fairly differentiate between employees, in order to compensate fairly. The organisation therefore is required to discriminate between employees in terms of value contributed to the organisation in order to reward accordingly. The evaluation of fairness ultimately resides in the accuracy and context of this distinction between the legitimate and illegal discrimination.

2.3.1 Legitimate Discrimination

It is necessary for the organisation, employing a heterogeneous labour force and operating within the labour market, to value labour differently and to reward employee behaviour differently. Discrimination leading to differential treatment between employees is considered legitimate should these reasons be linked exclusively to the inherent requirements of the job as necessary for the successful operation of the business, (termed business necessity).

While South African legislation does proscribe unfair discrimination on the arbitrary grounds, discrimination based upon the inherent requirements of the job is exempt from this definition. All the legislations referred to above, both domestic and foreign; make provision for differentiation between employees on those factors linked to the needs of the business. During litigation, the organisation is required to link differences in pay to the demands of the job/business or provide similar reasons (Grogan, 1996). The most comprehensive of the South African clause is found in repealed Schedule 7

Subsection 2(c) of the Labour Relations Act (Republic of South Africa 1995) simply stating that any discrimination based on an inherent requirement on the job does not constitute unfair discrimination. The Employment Equity Act (Republic of South Africa, 1998) Subsection 6.2(a) echoed the above stating that it is not unfair to distinguish, exclude or prefer any person on the basis on an inherent requirement of the job. The inherent requirement of the job is derived from the most central and important part of a job, which determines the requisite competencies of the job incumbent. The courts are not concerned with minor parts of the job (Botha, 2000; Landman, 2000). As cited above, The Promotion of Equality and Prevention of Unfair discrimination Act (Republic of South Africa, 2000) refines this distinction further. The court is also asked to consider among others:

- the impact or likely impact of the discrimination on the complainant;
- whether the discrimination has a legitimate purpose;
- whether and to what extent the discrimination achieves its purpose;
- whether there are less restrictive and less disadvantageous means to achieve the purpose.

Of particular importance to this study is an economic rationale for unequal treatment in which discrimination, by way of wage differentials, may be substantiated on grounds such as skills, qualifications, responsibility and experience. The law, however, also protects employees against discrimination where the employer has abused this business prerogative albeit unintentionally. Protected classes therefore do not automatically receive preferential treatment as legitimate discrimination includes discrimination against protected classes. In this sense, the fact that the discrimination negatively affects a population subgroup is secondary to the link to business or economic factors.

Landman (2000, p. 195) in *Louw versus Golden Arrow Bus Services* asked the following questions established by the Constitutional Court in *Harksen versus Lane* (1998).

- (a) Does the act or omission (referred to in Item 2(1)(a)) constitute differentiation between people or categories of people?
- (b) If the answer is positive, the court embarks on a two-stage analysis:
 - (i) Firstly, does the differentiation amount to discrimination? If it is on a specified ground, then the discrimination will have been established. If it is not on a specified ground, then whether or not there is discrimination will depend upon objectively, the ground is based on attributes and characteristics which have the potential to impair the fundamental human dignity of persons as human beings or to affect them adversely in a comparably serious manner.
 - (ii) If the differentiation amounts to discrimination, does it amount to unfair discrimination? If it has been found to have been on a specified ground, then unfairness will be presumed. If on a unspecified ground,

unfairness will have to be established by the complainant. The test of unfairness focuses on the impact of the discrimination on the complainant and others in his or her situation.

The applicant must prove that the reason for discrimination is attributed to a particular ground, and it is not sufficient to merely prove discrimination. Landman (2000, p. 197) also referred to the question asked by English courts, referring to the United Kingdom case, *James versus Eastleigh Borough Council* (1990) where the question was formalised as: “Would the complainant have received the same treatment from the defendant but for his or her sex?” Landman (2000, p. 198) concluded that:

... there will be unfair discrimination to the extent that discrimination in the case under investigation is caused or contaminated by it. This exercise is unlikely to be easy. It is akin to an attempt to unscramble an omelette. But, I believe, it is the only way to give effect to the injunction not to discrimination of the impermissible grounds leaving permissible discrimination intact.

A likely solution, in many situations, to the required unscrambling task resides in multiple regression analysis since it seems to permit the isolation of the effects of impermissible discrimination from those grounds deemed appropriate.

Landman (2000, p. 199), continued in finding that an employer may increase and alter pay of a particular job on objectively justified economic grounds but “how it is to be applied in the circumstances of each case depends on the facts and falls within the jurisdiction of the national court.” This lies at the centre of the question posed by this thesis. Although Landman (2000) is correct in this position, it leaves many questions on behalf of employers. The court in this case, feels that it is reasonable to expect organisations to wait for a judge to decide on how legitimate grounds should be applied, and possibly stand the risk of receiving a penalty should their compensation philosophies differ from the opinion of a presiding judge. This uncertainty is removed somewhat as the judge is charged to evaluate fairness as would any reasonable man giving organisations leeway to premeditate the likely court’s stance (Landman, 2000). Nonetheless, it would serve the interest of organisation if the concept of compensation fairness could be conceptualised and operationalised with sufficient preciseness to permit organizations the opportunity to conduct equity audits of their compensation practices. In order to arrive at a concept of compensation fairness, it is necessary to elaborate on fairness as that which is evaluated in the context of the values of society and related to the norms of justice.

2.3.2 Fairness and Justice

Fairness also has both a subjective and objective connotation, firstly, in the sense that individuals act reasonably, according to national custom, standards and practice and secondly, as the legal conviction of society based on its value system (Poolman, 1985). In other words, fairness is understood firstly as a concept rooted in justice theory, as purely a value judgment, perceived by individuals and secondly as demonstrable, factual standard. As the court is an agent of society, this legal conviction attempts to incorporate the value judgment arising from the first connotation. The key distinction here is that the latter lends itself to an objective appraisal.

Poolman (1985, p. 191) defined fairness to be “a process of procedural and substantive fairness which gives rise to reasonable and just results in or arising from labour relations between employees and employers collectively or individually, each of the parties is substantially equal, in the public interest.” “People develop norms concerning what is fair and what is unfair treatment...The norms of reciprocity and fairness that function in the greater society are critically important in the functioning of economic organizations...” (in Pinder, 1998, p. 286). While Pinder (1998) understood the terms to be used interchangeable, Poolman (1985, p. 43) differentiated between fairness and justice in that:

...fairness is a general duty to act fairly... This duty finds expression in the national sense of justice... Fairness is an ambiguous concept and delves deep into morality. This means that different persons will have different conceptions of fairness. On one hand, fairness will mean equality in the strict sense of justice. On the other hand, fairness will mean consent in terms of principle of freedom of contract. In the latter case there is a presumption that both parties are on an equal footing and an equal distribution of social power

2.3.2.1 Justice Theory

The principles behind a fair compensation system, are rooted in Justice theory, which consists of three elements namely, distributive, procedural and interactive justice (Pinder, 1998, Muchinsky, 1997). Although justice theory centers on the role of perception, the theory outlines the values of societal norms of fair practice (what society as a whole perceives to be fair). This forms the basis for an objective model of fairness, against which criteria the compensation system must ultimately meet.

2.3.2.1.1. Distributive Justice

Distributive justice refers to the fairness of the outcomes and may be ascribed to Adam's Equity theory based on a theory of work motivation explaining the principle behind how much a person is willing to contribute based on a social comparison to the effort of others (Muchinsky, 1997). The literature (Lawler, 1981; Milkovich & Newman, 1993; Pinder, 1998) uses the term equity to address the perceptions of employees of their satisfaction of job outcomes in relation to referent others. Feelings of inequitable treatment tend to occur when employees believe they are not receiving fair return for their contributions. Bies (in Pinder, 1998) explained that when individuals in an organisation perceive an apparent violation of justice norms, there is a tendency to experience feelings of anger, resentment and moral outrage.

Adam's equity theory (in Hills *et al.*, 1994) is the most suitable theory to explain the motive behind the applicant's claim of unfairness that is a feeling of inequity. "The employee's determination of fairness is based on the comparison of the value and cost of that individual's employment relationship to the value and cost of another party" (Adams cited in Hills *et al.*, 1994, p. 57). The employee makes a comparison, examining the wage level of a position or the wage increases granted annually. The employee evaluates the wage level of the position with other positions within and outside of the organisation to decide upon the fairness of the treatment. Similarly, the employee evaluates annual increases to determine fairness. The employee examines the relative input/output relations of each position. The inputs refer to those competencies and effort a job incumbent applies in- or contributes to the job, (education, skill, experience, effort, intelligence), while the output refers to the benefits derived from the job. It is important to note that these benefits are not exclusive of pay and the evaluation of outputs may include the intrinsic inducements, which were mentioned above (working conditions, status, and seniority). The employee would use a referent, usually, but not limited to, similar positions to those of the individual. A referent could also center on the historical experience of the employee. The evaluation is the conceived comparison of the ratio of inputs and outputs, between the two positions (Hills *et al.*, 1994; Muchinsky, 1997). Fairness is perceived as both ratios being equal, and unfairness is perceived when the referent is perceived to possess a higher ratio. Should the outcome be greater in favour of the referent, the employee is moved to a feeling of inequity (Hills *et al.*, 1994). Unfortunately, as Lawler (1981) reported, individuals tend to misperceive the rewards of others. These perceptual errors often lead to dissatisfaction, as the individual tends to overestimate the pay and/or, underestimate the performance (inputs) of others.

In general, equity refers to the relation of individuals' inputs into the organisation, with the outcomes from the organisation. In a state of equity, the compensation package, of intrinsic and extrinsic rewards, is in proportion to others in the labour market.

Lawler (1981), summarised the literature, to reach the following four conclusions:

- Satisfaction with a reward is a function of how much is received and how much individuals feel should be received.
- People's feelings of satisfaction are influenced by comparisons with what happens to others.
- Overall job satisfaction is influenced by how satisfied employees are with both the intrinsic and extrinsic rewards they receive from their jobs. The above is detailed in Figure 2.

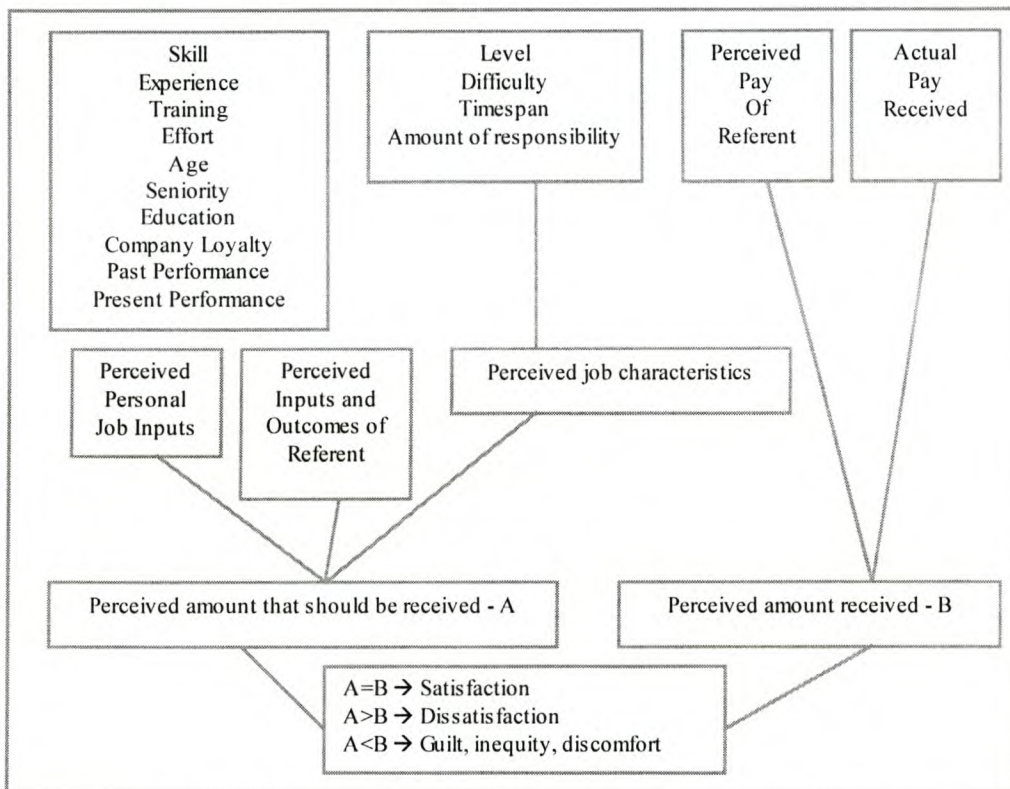


Figure 2: Model of Determinants of Pay Satisfaction (Lawler, 1981, p. 13)

Lawler (1981, p. 33), wrote:

People's reactions to their pay and their perceptions of what is fair are subjective. As a result, there is no such thing as an objectively right pay that will be accepted by everyone. Unfortunately, what is perceived to be right by one individual often is not perceived to be right by others. Hence, pay determination involves differing perceptions, values and conflicts.

The maintenance of equity is an integral and often elusive aim of successful compensation systems. The perception of a state of equity has strong positive effects on employees and the maintenance

thereof is but an important aspiration of the compensation system. “Considerable research has demonstrated a positive relationship between pay and job satisfaction, the perceived equity or fairness of one’s pay can be more important than the actual amount” (Schultz & Schultz 1994, p. 286). Distributive justice is therefore important in the design of the compensation system as the organisation attempts to use pay to increase job satisfaction in order to reduce turnover and absenteeism (Lawler, 1981). The use of labour market surveys, job evaluation and performance appraisal is essentially concerned with ensuring the compensation is perceived as equitable (Hills *et al.*, 1994). However, success in the creation of a compensation system that is perceived as distributively fair does not absolve the organisation of the burden of proof that its compensation system is also substantially fair. It, however, would most probably reduce the likelihood of the compensation system being challenged in terms of equity legislation.

2.3.2.1.2 Procedural Justice

The second element of justice is procedural justice, which refers to the methods used to allocate those outcomes. According to Leventhal (in Hills *et al.*, 1994), the employee evaluates the amount of control or input they may exercise on the following elements to determine the fairness of decisions.

- Selection of the decision maker
- Determination of the ground rules
- Method for gathering the information
- Decision-making procedure
- Appeal procedure decisions
- Process to ensure the decision maker is correctly using his or her power
- Appeal procedure to review the process.

In the context of compensation, procedural justice would imply that employees are firstly informed about the implementation of a job evaluation system, educated on- and more importantly consulted on the elements of evaluation. Importance concerns, suggestions or possible areas of dispute can be used taken into consideration. By gathering input from the employees themselves, employees are involved, committed and accepting of the new system.

2.3.2.1.3 Interactional Justice

Theorists have distinguished between procedural justice and interactional justice, the latter referring to quality and content of person-to-person communication. In the compensation context, interactional

justice addresses the perception of justice, based on how a compensation policy or procedure is communicated to and interpreted by employees (Pinder, 1998). Bies and Moag (in Hills *et al.*, 1994) identified a further four elements which form the interpersonal communication element of fairness in decision-making. These were truthfulness, respect, propriety of questions and justification. Kramer and Tyler (in Pinder, 1998) spoke to the role trust plays in the equity and perception of justice.

The above approach to equity relates to interventions aimed to influence employee perceptions and behaviour. To prevent these feelings from emerging, organisations must distribute rewards according to employee beliefs about their own value to the organisation and within the tenets of the norms of equity (Pinder, 1998). As discussed later, there is often a trade off between internal and external equity, and it is a goal of the organisation to manage this balance in order to successfully function within the labour market while maintaining employee job satisfaction and motivation.

According to the Promotion of Equality and Prevention of Unfair discrimination Act (Republic of South Africa, 2000), the evaluation of fairness is based on outcome. This negates the court's basis to consider procedural and interactional justice as evidence, although it is likely that the applicant will approach the court due to misgivings in this area – there is, however, no legal prohibition concerning procedural and interactive justice in the compensation context. Furthermore, distributive justice is also only relative in so far as assisting the court to evaluate fairness in the context of what society deems fair. However, as discussed later, due to the effect elements of justice theory have on the success of the compensation system - the system would not function should organisations neglect the role of employee perception. For this reason, *bone fide* (nondiscriminatory and effective) efforts to manage employee perceptions for the purpose of attracting, maintaining and motivating employees are regarded as legitimate factors in determining compensation level. These efforts must therefore present a foundation upon which the court can build a concept of what Pinder (1998) termed, actual equity, a term meaningless without the appreciation of the equity norms. The court, being concerned with compensation outcome, does not evaluate distributive justice in terms perceived equity, but in terms of equality.

2.3.3 Equity versus Equality

This thesis argues a clear distinction between perceived equity and the proof of equality as required by the burden of proof laid upon organisations by South African employment equity legislation. Pinder (1998) clarified the difference between equality and equity. The norm of equity refers to most of the

intrapyschic subtleties and centers on the above-described perceptions of the employees as explained by equity and justice theory. While perceived fairness may not be sufficient to shift the burden of proof, it is nevertheless the cornerstone to a good compensation system. The court should differentiate between the employee's feelings of inequity and what the society considers fair; ignoring the former and using the latter to develop a notion of actual/substantive fairness with which the courts can test for fairness.

The truism "one man's fair is another man's foul" is an appropriate analogy to describe how a compensation system can be perceived and judged differently by different individuals. Hence, it is unlikely that a court would find evidence that ninety-nine percent of the employees in the organisation return a decision of fairness as sufficient proof the compensation system sufficient to prove the compensation fairness. It would likewise be arbitrary should the one percent applicant group present evidence to the contrary.

This rationale could be illustrated by the following (extreme) hypothetical example of an organisation comprised of management who hold all information regarding the compensation system, and uninformed (or even intimidated/fearful) employees who willingly accept their own salaries, ignorant of how compensation level is determined. Although all of the employees, if interviewed or surveyed, could avow to the fairness of the compensation system, it has no bearing on the equality. It is also likely that at certain levels or over areas of the organisation, illegal discrimination could be less marked or non-existent. Similarly, disgruntled employees or those seeking to bolster trade union support, could generalise their negative perceptions onto the compensation system, or in extreme cases, make an opportunity of such an investigation to maliciously target the individual or management group responsible (and *visa versa* with positive perceptions and supervisor sympathy). There is some evidence attesting that perceived fairness is an unreliable and invalid measurement (Barrett & Sansonetti, 1988) and this indicates that perceived fairness/feelings of inequity should play a limited role in the presentation of evidence. Employees may perceive unfairness regardless of the fact that no illegitimate discrimination exists. Alternatively, should one hundred percent of the employees experience feelings of inequity, the organisation has not necessarily contravened legislation, (despite the motivation of employees to enter a grievance.) In summary, the acceptance of a compensation system by employees is certainly found wanting as proof of compensation fairness and as such an organisation is not relieved of the burden should the employees of the organisation vouch in favour of the system.

On the other hand, equality (actual equity) does not attempt to imagine the perceptions of employees but rather centers on the principle of equal treatment (Pinder, 1998). Perceived equity undoubtedly could be a sign of equality in the organisation but it is highly implausible that the legislation concerned with perception but rather uses the terms *de facto* fairness, as in chapter three of the Promotion of Equality and Prevention of Unfair Discrimination Act (Republic of South Africa, 2000). That is, an evaluation of fairness, as per Pinder (1998) and Poolman's (1985) second connotation of fairness, based on the facts of the case and therefore all legislation, must be interpreted as referring to the demonstration of equality. This is in contrast to the earlier Labour Relations Act (Republic of South Africa, 1995) and Employment Equity Act (Republic of South Africa, 1998), which refer to the equity. The latest legislation, the Promotion of Equality and Prevention of Unfair Discrimination Act (Republic of South Africa, 2000) has used terminology that is more appropriate. Furthermore, in this Act, the opinion of fairness is *de jure*, reserved for the judge, and may be presented to the judge in terms of *de facto* equality. Although equality and fairness are generally synonyms, it may be gleaned from the phrasing of the Promotion of Equality and Prevention of Unfair discrimination Act (Republic of South Africa, 2000) that equality refers to the sought after condition or state, while fairness refers to a property of the system which results in equality. *De facto* equality is reached through application of a *de facto* fair employment process.

Before an interpretation of a fair compensation system can be introduced, it is necessary to examine fairness in the compensation context. This may be viewed in terms of two general approaches namely, "equal pay for equal work" and "comparable worth."

2.3.4 The Development of the Concept of Compensation Fairness

While comparable worth has been implemented more successfully in Canada, the process was not widely disputed in comparison to the heated legal debates of the United States. The United States case law has dredged up many of the critical issues, which underpin equity legislation. The development of comparable worth theory and the development of American equal rights legislation is entwined and laden with controversy. While the equal pay approach is generally accepted and enforced by legislation, a question mark hangs over the issue of comparable worth. The foreign experience will certainly contribute to the establishment of South African precedent and its practical implications, but it is debatable whether South African courts will eventually reach the same conclusions. The history of comparable worth is important to its credence and manner in which it may gain acceptance in South Africa

The first mention of Comparable Worth ideology arose from the adjustment of wages by the 1942 United States War Labour Board (Golper, 1983). Three years later, two of the members who had served on the above board, introduced the Equal Pay Bill. The bill provided that “it would be an unfair labor practice for an employer engaged in commerce to pay women less than men for comparable work” (cited in Golper, 1983, p. 564). This Bill was not passed. In 1962, equal pay legislation was taken seriously by the Kennedy Administration whom sought to prohibit “sex-based disparity in wages for work of comparable character on jobs the performance of which requires comparable skills” (cited in Golper, 1983, p 564). The Senate rejected the use of a comparable work standard and replaced it with an equal work standard, and so emerged the above-mentioned Equal Pay Act (England, 1992; Golper, 1983; United States Congress, 1963).

2.3.4.1 Equal Worth

The Equal Pay Act (United States Congress, 1963, p. 5) read:

No employer having employees... shall discriminate within any establishment in which such employees are employed, between employees on the basis of sex by paying wages to employees in such establishment at a rate at which he pays wages to employees of the opposite sex in such establishment for equal work on jobs the performance of which requires equal skill, effort and responsibility, and which are performed under similar working conditions except where such payment is made pursuant to

- (i) a seniority system
- (ii) a merit system
- (iii) a system which measures earnings by quantity or quality of productions
- (iv) a differential based on any other factor other than sex.

American Congressman Goodell, a member of the House Subcommittee on Labour and the sponsor of the original bill, emphasised that the word “equal” had in fact, replaced the word “comparable” during the drafting of the bill, in that the Labour Department did not expect attempts to rate jobs that were not equal, or evaluate to reach same skills or points. After this issue was discussed extensive in the Senate, it was agreed that the purpose was not to coerce organisations into equality in pay for jobs of different content. To this the congressman stated unequivocally that the Act is only to apply to jobs “substantially identical or equal” (cited in Golper, 1983, p 564). The courts have since clarified the term “substantially equal,” by considering work content rather than job titles, using 95% as the degree of correspondence required between the two jobs being considered to be regarded as equal (England, 1992; Golper, 1983). By way of example, should 95% of the tasks in two jobs be identical, while the

other 5% comprise of unrelated tasks, the court finds the jobs substantially equal and therefore requiring equal pay (England, 1992). (This is in accord with the above defined “inherent requirements of the job,” referring to the principal parts of the job.)

The principle of equal pay has since remained unchanged, requiring that should two jobs entail the same job content (and job specification), the job incumbents be paid at the same compensation level. In the seminal South African compensation case, Louw versus Golden Arrow Bus Services (Landman, 2000), reference was made to equal pay. Landman, (2000, p. 196) wrote:

These premises [equal pay for equal work] have not been enshrined principles of law in the unfair labour practice definition. They are principles of justice, equity and logic which may be taken into account in considering whether an unfair labour practice has been committed.... .. it is not an unfair labour practice to pay different wages for equal work or for work of equal value. It is however an unfair labour practice to pay different values for equal work or work of equal value if the reason or motive, being the cause for so doing, is direct or indirect discrimination on arbitrary grounds or the listed grounds.

Landman’s referral in this case to notions of societal values that are not encoded into current legislation, has particular import to an argument of comparable worth, and the courts obligation to extend such societal values into litigation.

2.3.4.2 Comparable Worth

The American Civil Rights Bill targeting racial discrimination was proposed to the House of Representatives nine days after the Equal Pay Act (United States Congress, 1963) had become effective. During the initial phases of ratification, Congress again explicitly rejected the notion of comparable worth following attempts to have comparable worth applied through Title VII of the Civil Rights Act (Gunderson 1994a; United States Congress, 1964). Title VII of the above Act dealt with employment discrimination, which broader scope than the Equal Pay Act (United States Congress, 1963) since it included all other employment processes, and it prohibited discrimination based on factors such as race, colour and religion. In order to avoid any potential conflict, Senator Bennett offered an amendment to Title VII, to reconcile the two sets of legislation, stating that employers would not be in violation of Title VII if they paid different wages as long as such differences were authorised under the Equal Pay Act. The Bennett Amendment held that, should conflict arise between Title VII and the Equal Pay Act, Title VII would take favour. Senate passed the Civil Rights Act with the Bennett Amendment (Golper, 1983; England, 1992).

Initially, there was some ambiguity as to whether the Civil Rights Act restricted comparisons to "equal work" as is clearly the case under the Equal Pay Act, or whether it would encompass the broader concept of comparable worth (Gunderson 1994a). The Bennett Amendment also included the aforementioned disparate treatment (direct discrimination) and disparate impact (indirect discrimination) doctrines, as two theories of discrimination and outlined the respective burdens of proof required (England, 1992).

Fuelled by poor results offered from affirmative action programmes, legal debate centered for years on the interrelationship between the two sets of legislation (despite Congress having rejected any type of legal cause of action based on a comparable worth theory.) The legal argument against comparable worth maintained that the Bennett Amendment intended that no claim was applicable under Title VII unless it was applicable under the Equal Pay Act (United States Congress, 1963). The legal proponents of comparable worth contended that such claims could be produced under Title VII because of the Bennett Amendment (Borjas, 1996; Golper, 1983).

A dilemma erupted when courts interpreted the two statutes as being coextensive and required that all compensation claims based on the Title VII first meet the Equal Pay Act (United States Congress, 1963) criteria. Plaintiffs who alleged any type of compensation claim where the jobs in questions may have been similar or comparable but not substantially equal were not successful even though it was alleged that the employer had intentionally discriminated against them (Golper, 1983).

During 1979, a number of circuit court of appeals mutated this position ruling that the Equal Pay Act (United States Congress, 1963) did not apply to an action under the Title VII holding differences in the wages could be attributed to discrimination should jobs be unequal, but comparable (Golper, 1983). This signaled the departure from the original intentions of Congress and legislation.

In *Gunther versus County of Washington* (1981), the United States Supreme Court upheld a Circuit Court's decision, that the Bennett Amendment did not prohibit comparisons under Title VII simply because they were prohibited under the Equal Pay Act (United States Congress, 1963). The court supposed that the Amendment was not intended to limit wage discrimination cases to those that meet the requirements of the Equal Pay Act (United States Congress, 1963) but rather to include the four defenses into Title VII. The court found that pay discrimination might occur in establishing pay differences for (unequal) dissimilar jobs and for all intent and purposes; the court opted in favour of comparable worth. Comparable worth advocates used this decision to argue for comparable worth

cases, opening the door for comparable worth through legislative processes. The case however raised many important questions regarding how the burden of proof outlined in the first Act impacted on the Disparate Treatment and Impact theories of the second (England, 1992; Gunderson 1994a).

A year later, the Bennett Amendment dispute was muted by the District Court's ruling in *American Federation of State, County and Municipal Employees (AFCME) versus the State of Washington*, (1985). The State of Washington had commissioned a job evaluation study, which found that the state discriminated against women. The comparable worth claim was rejected and the market defense held up. The judge ruled (to Milkovich and Newman, 1993, p. 488), "Economic reality is that the value of a particular job to an employer is but one factor influencing the rate of compensation for that job." The court indicated that this was not a comparable worth case because the court itself was not being required to evaluate the worth of the jobs. Rather, the court based its decision on the fact that the state of Washington ignored their own study. The issue being, according to Milkovich and Newman (1993, p. 488), "If an employer's own job evaluation study shows jobs of dissimilar content to be of equal value to the employer, then isn't failure to pay them equally proof of intent to discriminate?"

The Reagan Administration filed a brief against the concept of comparable worth, and both the Equal Employment Opportunity Commission and the US Civil Rights Commission indicated the comparable worth concept to be unsound and impractical. The United States Court of Appeal for the Ninth Circuit subsequently reversed the District Court decision (Gunderson 1994a). The Vice Chairman of the United States Civil Rights Commission (cited in Browne & Giampetro, 1987, p. 476) stated,

When a employer sets wage levels in his or her firm according to market wage rates, there is not, and by definition cannot be, an act of sex-based wage discrimination. It is merely the free and fair operation of a market-based economic system.

These statements reflected a Neoclassical approach to the labour markets, which are regarded as being purely competitive. The Appeal Court ruled that the state was not required to increase the relative pay of women as "the employer's merely being aware of adverse consequences for a protected group did not constitute discrimination. The plaintiff must show the employer chose the particular policy because of its effect on members of a protected class" (cited in Milkovich and Newman, 1993, p. 488). The parties settled out of court, and soon implemented comparable worth adjustments.

A similar case, *American Nurses' Association and others versus State of Illinois* (1986) also involved evidence from job evaluation studies to show women's jobs being paid less than men's. The Circuit Court in this case, however, found that this was not sufficient evidence to make a *prima facie* case. In

both cases, the court ultimately found that failure to implement comparable worth adjustments suggested by their own job evaluation study did not constitute intentional discrimination (England, 1992).

Assuming discrimination does and can exist in a labour market, every employer is nonetheless constrained by market forces when establishing labour costs. Jobs must be filled as required, so compensation must reflect the realities of the labour markets, whether or not the markets seem fair (Veysey, 1985). The judge in *Spaulding versus University of Washington* (1984) agreed with this position but entered important perspective on use of market forces to explain wage differences (Milkovich & Newman, 1993):

Employers who rely on the market deal with it as a given and do not meaningfully have a policy about it... Allowing reliance on the market to constitute a facially neutral policy for disparate impact purposes would subject employers to liability for pay disparities with respect to which they have not, in any meaningful sense, made an independent business judgement (Milkovich & Newman, 1993, p. 487).

Amendments to the Civil Rights Act (United States Congress, 1991) was passed instituting more punitive damages and compensation to victims of intentional discrimination, and allowing plaintiffs the right to a jury trial. The new Act advocated litigation as the preferred means of resolving conflict, rather than the conciliatory framework of the previous Act (Anonymous, 1996).

Comparable worth theory has, in America, found mixed success in litigation, but as mentioned previously has been successful in federal courts. Although court decisions have been mixed, state and local governments have since introduced comparable worth programmes. Comparable worth flourished under state legislation, through collective bargaining and organisational initiatives and has been implemented in different ways by federal and state institutions, court and commercial organisations, and has therefore taken on many descriptions and approaches. That is, the mixed court decisions were only one mechanism in the spread of the ideology. Gunderson (1994a; 1994b) documented the implementations of in the public sectors of Minnesota, California, Iowa, Oregon, Washington, New York and Wisconsin where the former was the only state to have turned to legislation. Moore and Abraham (in Pinder, 1998) included New Mexico and Massachusetts in this list. Chen and Kleiner (1998) added Connecticut, Delaware, Hawaii, Illinois, Maryland, Michigan, New Jersey, North Carolina, Ohio, Vermont and West Virginia, as stated which have enacted legislations requiring their municipalities to provide employees with equal pay for jobs of comparable worth. The remaining states relied on collective bargaining processes, and volunteering organisations. Minnesota and Washington has reached full implementation, requiring the use of job evaluations by

law in determining the comparable worth for each job, as well as the identification of any disparity. When such were found, they were debated and resolved through the collective bargaining process. Minnesota also included penalties, which are imposed upon those failing to meet comparable worth requirements (Gardener & Daniel, 1998). Although comparable worth has been disputed in the public sector, it has not often been contended in the private sector however, but Gunderson (1994b) added that that a number of American state legislations could be interpreted as requiring comparable worth.

2.3.4.1 The Comparable Worth Debate

Equal pay for substantially similar work, requires jobs to be substantially the same but allows jobs to differ slightly in a particular dimension of the job. Comparable worth merely expands the scope of conventional and generally accepted equal pay for equal work legislation (and the intent of the law), in order to rectify systemic discrimination, which is often the accidental spin-off of the employment process (Gunderson, 1994a). In doing so, equal work for work in a substantially equal job has evolved to allow for the latter interpretation permitting comparisons across dissimilar jobs. Here, comparable work is credited to equal worth. That is, jobs that are dissimilar but equal in terms of value or worth to the employer deserve equal pay (Pinder, 1998).

“Implementation of comparable worth further requires that inherent job worth be measured with reasonable accuracy” (Jane, Gorden, Joines & Phillips, 2001, p. 806). Comparable worth endeavours to make wage comparisons across dissimilar jobs, should they prove quantifiably equal according to a neutral job evaluation system. This necessitates comparisons between different jobs, which are dissimilar in distinct tasks, so the question arises as to how two jobs are considered comparable (England, 1992). Comparable worth can only be applied should a single measurement be developed which can access all jobs. For example, a common ground or common value attribution enables meaningful comparison between male dominated machinists and female dominated receptionists. In order to achieve “comparable pay for jobs of comparable worth,” the search is for a generally accepted criterion of the intrinsic value of work (Mahoney, 1983, p. 14). In essence, the intrinsic value of work is a construct for which an observed variable is required with which to measure the attributes required of the job incumbent and work, which rightly should determine pay.

Debates over comparable worth policies are motivated by findings that the gender composition of an occupation or job category exerts a net effect on its wage level after other factors are accounted for (England, 1999). Comparisons are established between jobs dominated by contrasting groups. A male

dominated occupation is a job commonly, but not exclusively performed by males (and *visa versa*). The allegation of discrimination is founded in the claim that the disparity in compensation between two jobs is a result of bias against one of the contrast groups, rather than on job characteristics, inherent to the functioning of the business (England, 1992).

The blame should lie on the institutionalised societal inequities should immoral societal factors systematically deny a particular group to develop the competencies or potential competencies required to do higher valued jobs, and not on the compensation system. However, should a particular group be comfortable in a particular occupation, (for example women are more likely to seek a nurturing occupation such as nursing), and that occupation is valued lower due to the fact that it is dominated by the group, the blame does lie with the compensation system. Equal pay is blind to these disparities.

Opponents of comparable worth practices typically use a market defence to justify wage disparity, in that the market alone appropriately determines the relative value of individuals' competencies. By this claim, discrimination is a result of traditional male jobs requiring a higher wage in the existing labour market, even though, an employer might value male and traditionally female jobs equally. This defence assumes one homogenous labour market, which is purely competitive, impersonal and incapable of malicious discrimination, comprised of impotent employers unable to alter the market, and highly mobile, informed job applicants who are in a position to reject offers of discriminating employers (Browne & Giampetro, 1987). To this Milkovich and Newman (1993) raised the following points in contest of the market wage approach:

- The relevant market the employer uses is not always evident
- Markets vary by occupation
- Differences in market definitions render different wages.

Economists campaign that free, unregulated labour markets, may result in a highly unequal distribution of income, resulting in inequality. Advocates of comparable worth have subscribed to this. Labour markets, according to Browne and Giampetro (1987) are typically characterised by an imbalance of information and mobility. The greater this imbalance, the weaker the insistence for market determination of wages becomes. A labour market characterised by an imbalance of power deserves earnest consideration, as discrimination will prosper since profit seekers would be willing to take advantage of the different supply curves of labour.

It is understandable why Grune (in Hollenbeck, Ilgen, Ostroff & Vancouver, 1987) claimed that the labour market is one of the most damaging transmitters of wage discrimination. England (1992) cited countless recent studies showing market wages to be the persistent and most prominent cause of current wage discrimination.

There is large support for interventions seeking to regulate the market and redistribute the still skewed income distribution. An example of this is minimum wage legislation. “This group generally advocates income redistribution through government tax and transfer programs, but does not necessarily call for direct regulation of the labour market” (Jane *et al.*, 2001, p. 806). Comparable worth follows suit; barring the fact that it is a direct approach, aimed at inequities based on relative wages, where the wage of one job is considered too low in proportion to another. The corrective action advocated by comparable worth, involves “fine-tuning an employer's entire compensation structure from top to bottom” (Jane *et al.*, 2001, p. 806). An organisation, as an agent of capital, exists with the purpose to seek profit, and it can be argued that the role of the organisation is not to regulate equity. Unless it can be found that comparable worth policies render profit gains, organisations will be lax to incorporate practices to redirect market contamination. Therefore, should it be found that labour markets fail to accurately access worth, it is up to legislators to ensure organisations follow a clear set of guidelines (Browne & Giampetro, 1987).

Comparable worth theory is based on the notion that the market forces of demand and supply result in socially unacceptable outcomes appealing for the involvement of legislation (Gunderson, 1994a). It implies that each job possesses an inherent quality, regardless of market forces, upon which a value is placed which determines the remuneration the job incumbent should receive (Cogill, 1990). While there seems to be no consensus as to the specific meaning of comparable worth, the most followed definition seems to be that of Gasaway (cited in Golper, p. 564) “comparable worth stands for the concept of equal pay for work that involves responsibilities of commensurate value to the employer.” That is to say, work measured on internal job criteria and not market criteria. Comparable worth severs the link between the organisation and the external labour market (Borjas, 1996).

Proportionate pay for work of proportionate value, as described above, is now emerging as the next stage in comparable worth thought (Cogill, 1983; Gunderson, 1994a). (Proportionate pay might be interpreted as requiring comparable pay for comparable jobs. That is, offsetting job dimensions, but also requiring that pay differences be in proportion to the difference in comparable worth.) Although

this is speculation, it is noteworthy that Section 27 of the Employment Equity Act (Republic of South Africa, 1998) chose this particular terminology.

2.3.4.2 Approaches to Comparable Worth

One of the central themes of this thesis is that equality should be evaluated in terms of societal views on equity (Pinder, 1998). Value judgments regarding the distribution of income and wealth in society take a number of forms, which are a manifest of social criteria of fairness and justice. There are a number of approaches and dimensions of comparable worth theory, which illustrate its pervasive status within South African society, legislation and economic policy. Mahoney (1983) reviewed four different approaches to comparable worth theory:

- Social Philosophy Approach is based upon concepts of social comparison, reference groups, and distributive justice (Homans in Mahoney, 1983). It suggests that compensation should be proportional to the contribution made to society. This approach emphasises the work inputs and labour capabilities with reference to aspects of the job incumbent and nature of work. Equal work capabilities or work expenditure should be remunerated equally, and the pay differentials should be proportional to the capabilities applied or expenditure of work. This is in keeping with the proponents of comparable worth obliging employers to set wages within a particular company reflective of employee's worth or contribution to the success of the enterprise (Browne & Giampetro, 1987).
- Economic Theory whereby Neoclassical economics approached comparable worth as, "individual valuations expressed as market changes" (Mahoney, 1983, p. 16). Employees and employers attribute worth to the exchange of labour, in terms of its opportunity cost, assigning different valuations. In competitive markets, market worth is reached at which the marginal rate of exchange occurs at a general equilibrium. Comparable worth is therefore defined in terms of the outcome of the labour market. Neoclassical economists believe in the efficiency of markets, and that "rent seeking" will occur should political process set wages (Paul in England, 1999). Through this paradigm, comparable worth is only available as an approach should job evaluation find market wages systematically violating the principle of using the same rewards for similar job characteristics in male and female jobs (England, 1999).
- Comparable worth as approached from a radical economic theory explains differences of worth in terms of an imperfect labour market. The differentials between occupations are explained in terms of intensifying and restricting competition among occupations. This is

approach echoed by the crowding hypothesis (Blumrosen, 1979; Edwards, Reich & Gordon in Mahoney, 1983; England, 1999).

- Administrative practice as noted by Lytle (in Mahoney, 1983) and Belcher (in Mahoney, 1983), emphasises the determination of worth by single employers applying job evaluation systems. Market surveys are an alternative to establish wage rates or validate a job evaluation system. The results of job evaluation often conflict with wage survey information (Mahoney, 1983).

Mahoney (1983) compared these approaches in terms of the relative emphasis on process versus outcome, the level of analysis and the focus upon the person versus the job. This is shown in Table 1.

Table 1: Comparative Dimensions of Comparable Worth Approaches (Mahoney, 1983, p 18).

	Traditions			
	Social Philosophy	Neoclassic Economics	Radical Economics	Administrative
Process/Outcome	Outcome	Process	Outcome	Both
Level of Analysis	Societal	Market	Societal/Market	Firm/Market
Person/Job	Person	Person/Job	Person	Job

Lavan, Katz, Malloy and Stonebraker (1987), described the three main vehicles through which comparable worth differences are reduced. These were judicial, (*via* enforcement, lawsuits and legislation); interest group activities (*via* collective bargaining, public awareness); and action by public administrators (*via* job evaluation surveys and voluntary pay adjustments). Irrespective of which process is invoked, in the investigation, including negotiation, the use of job evaluation systems are required.

Regardless of which route South African eventually takes, the overarching principle of compensation fairness could loosely be phrased, “regardless of who you are, what you put into a specific job - is what you get out.” In order to discriminate fairly, it is necessary to measure those factors that legitimately determine compensation. To this end, job evaluation systems remain the foundation of fair compensation.

2.3.5 Job Evaluation Systems

The use of job evaluation systems developed out of necessity for a method to determine a company's wage structure and to rank jobs in an equitable manner (Perold, 1985.) Job evaluation procedures involve the identification of compensable characteristics contained within the job descriptions (Jane *et al.*, 2001). The British Academy of Management (in Snelgar, 1988, p. 17) defined job evaluation as:

The process of analysing and assessing the content of jobs, in order to place them in an acceptable rank order which can be used as a basis for a remuneration system. Job Evaluation, therefore, is simply a technique designed to assist in the development of new pay structures by defining relativities between jobs in a systematic and consistent manner

The International Labour Organisation described job evaluation systems as "a method to describe, analyse, compare and evaluate jobs within a unit, a branch, or an industry on the basis of the work content and the job requirements in order to place them under particular wage or salary grades" (Porschlegel in le Roux, 1985, p. 83.)

Job evaluation systems are typically scoring systems assigning points to jobs in an organisation, the sum of which translates into maximum compensation for a particular job level. The points are based on appropriate characteristics of either the person required to fulfill the position or the nature of the position. The points are then converted to pay scales (Cogill, 1990; Lawler, 1981). By plotting data from a wage and salary survey against the internal job worth score, a link can be established between compensable factors and the going market rate, resulting in a market pay line (Bereman & Lengnick-Hall, 1994).

2.3.5.1 Achieving Comparable Worth with Job Evaluation Systems

The argument in terms of which job evaluation systems operate rests on the notion that relative worth of jobs should be determined by job requirements and job characteristics (Grams & Schwab, 1985). The same level of compensation should be allocated to traditionally male dominated jobs and female dominated jobs should a gender-neutral job evaluation system rendering identical scores. Alternatively stated, jobs of different content are compared with one another on the same terms. This implies that job dimensions are weighed up against each other; for example, a job requirement of a university degree in one occupation may counterbalance harsh or dangerous working conditions of another.

Job evaluations, if used properly, do provide a tool for correcting this discrimination within organisations, while still allowing markets to determine which characteristics of jobs have value, assuming predominantly male and female jobs are treated identically (England, 1999). This is why Remick (in England, 1999) defined comparable worth as the application of a single, bias-free job evaluation system within a given establishment across job families, to both rank jobs and set salary. Armstrong and Baron (1995) added that job evaluation should be concerned with comparable worth, as far possible, to ensure that men and women doing work of equal value are graded and paid the same. Job evaluation can reveal inequities and reveal discrimination in the market.

The implementation of comparable worth has met both success and failure. From a job satisfaction perspective, (not a legal perspective) comparable worth can only be successful once the parties agree to a common ground between jobs. Bellak, Bates and Glasner (1983, p. 423) explained that job evaluation systems facilitate the application of comparable worth “in an arena where employees understand the culture of the organisation and accept the value system implied by the job evaluation methodology,” but cannot exist as a homogenous job content/pay relationship. This is due to sectors and industries of the economy paying differently for jobs of equal worth. Differences also exist as employees in one company may be drawn from different competitive markets. In addition, certain functions at various times may be considered of higher value and may therefore command a higher worth for jobs of equal content. Lastly, geographical differences and the outcomes of collective bargaining processes may also play a role.

Despite all the denigrations, comparable worth has found great success abroad. The following are basic steps involved in the implementation of pay equity in the United States and Canada:

- Male-dominated and female-dominated jobs were identified within the organisation, with gender dominance usually being defined in terms of a quantitative cut-off like seventy percent or more of either sex.
- The jobs were then evaluated according to an unbiased job evaluation system.
- The relationship between compensation and job evaluation results were established, often by estimating separate pay lines for the male-dominated and female-dominated jobs.
- The pay in the undervalued female-dominated jobs was then adjusted to the pay of male-dominated jobs of comparable value as established by the job evaluation procedure (Gunderson, 1994a).

Gunderson (1994b) pointed out a number of difficulties associated with the implementation of pay equity. Among others there were:

- Job evaluation procedures and the statistical estimation of the relationship between pay and job evaluation points require professional input and are fraught with technicalities;
- Legal issues arise with respect to such factors as collective bargaining issues with respect to such factors as the role of the union;
- The technical requirements can cause mistrust and misunderstanding to develop;
- Adjustment of pay will cause an otherwise content organisation to reassess their equity (as in Equity theory);
- High cost incursions;
- The process could be misapplied or manipulated to serve purposes other than combating discrimination.

The implementation of equal worth has laid the groundwork for comparable worth practices. The comparison on jobs being unequal is not a far cry from the traditional comparison of similar jobs. Despite arguments against comparable worth, job evaluations, in any event, weight off different aspects of a job in order to arrive at a single score. Comparable worth is no departure from this, simply requiring that different content (in demarcated jobs) be weighed off. In this sense, it could be ventured that the use of job evaluation systems imply comparable worth and that the method and logic used to arrive at equal worth are identical. Essentially comparable worth implementation calls for a bias free evaluation of the worth of jobs (Armstrong & Baron, 1995; England, 1999). Comparable worth however, opens up the compensation system to more scrutiny by way of an additional criterion to which it must comply, another restraint not favoured by organisations. It may be argued however that the resistance to comparable worth by policy makers abroad is not motivated by the difficulty in implementation but the possible unsettling effects the widespread revaluation of jobs would have on the economy regardless of the successful record in dealing with the wage gap.

2.3.5.2 The Anatomy of Job Evaluation Systems

The fundamental anatomy of job evaluation systems remains and have remained unchanged despite superficial revisions. Cowan (1985) divided the process of job evaluation into three phases namely, the selection of criteria, the measurement process and job grading. Job evaluation systems are either based on quantitative or qualitative assessment. Quantitative methods are more elaborate and capable of more discriminating results while qualitative methods are simpler to apply but are rather limited in

their ability to discern differences between the jobs themselves (Livy, 1975). Job evaluation schemes may furthermore be subdivided into: (a) points rating several factors, (b) factor comparisons, (c) ranking whole jobs and (d) classification and grading (Armstrong & Baron, 1995; McNabb & Whitfield, 2001). Duvenage (1990) classified simple ranking and classification methods as non-analytical whole job methods, and point and factor comparison methods as analytical factor methods. While there are several job evaluation systems available in South Africa, studies have shown a high correlation between measurements offered by most commonly utilised job evaluation systems in South Africa are among others, the Paterson, the Peromnes, the Castellion, and the Hay systems (le Roux, 1985; Perold, 1985). Salary surveys for purposes of flexibility and usability often include a conversion scale between the measurement totals.

The continuum of job evaluation scores are ranked into levels, each comprising of a range of pay (Carrell *et al.*, 1998). Lord Denning (cited in Malone, 1980, p. 64), stated that, “a grading system according to ability, skill and experience is an integral part of business management; and as long as it is fairly and genuinely applied irrespective of sex [group], there is nothing wrong with it at all.” It would be valuable for a court to enquire as to the operational or structural basis on which jobs have been graded. As job grade directly determines pay, it is possible that grading can be used either maliciously or unintentionally to discriminate against groups, in a similar spirit to the political “Gerry-Mandering¹.” In this case, given a distribution of employees on a continuous rating scale, job grade cut offs can be inserted as to advantage more members of a particular group. Should there be no business requirement for these divisions, a defendant could be found wanting upon investigation.

2.3.5.3 Other Legitimate Factors influencing Compensation

Armstrong and Baron (1995, p. 28) explained that the traditional view of job worth is that people have nothing to do with the job they perform:

...this is clearly ludicrous. It is equally misguided to make the universal assumption that people adapt to the fixed specification of their jobs rather than believe that jobs should be adapted to fit the characteristics of the people in them.

Armstrong and Baron (1995, p. 28) also cited Lawler who stated:

¹ A colloquial term referring to the manipulation and strategic placement of constituency boundaries, after the British politician Gerry Mander. Mander cunningly sectioned off his opposition based on geographic polls, clustering off opposition strong holds. In this way, the number of constituencies won by his opposition was minimised. In this sense a job grade could be set where it has a disproportionate effects on population groups.

The job evaluation approach is based on the principle that people are worth what they do. In many cases this may not be the most desirable cultural value for the organisation. It tends to de-personalise people by equating them with a set of duties rather than concentrating on what they are and what they can do. It tends to de-emphasise paying for their skills and for their performances... If an organisation's key assets are its human resources, a system that focuses on people rather than on jobs is the better fit.

The job evaluation system reflects the nature of work and the qualities or competencies, which are required to be successful in the job – the relative value of a specific job, regardless of who fills the position. Job worth reflects the dimensions inherent in the job such. The focus is on firstly the job description, factors inherent with in the job, for example, task complexity, responsibility, level of decision making and; secondly, the job specification, factors related to the specific knowledge, skills and abilities of the required job incumbent (Carrell *et al.*, 1998).

Blum and Naylor (1986), referred to the ultimate criterion as the subject matter of Industrial Psychology. True performance is the ultimate criterion that in its broadest sense encapsulates all which compensation seeks to reward. This however, requires a broader definition of worth, to encompass those attributes of an employee which legitimately also command reward. From a practical perspective, there are other factors, which must be taken into account in order to realise a meaningful comparison between worth and compensation in order to investigate illegal discrimination correctly. These are typically linked to the job incumbent's work behaviour (people worth, for a lack of a better term), encompassing the value of the individual to the organisation.

The organisation essentially rewards performance worth, which requires a measurement of both job worth, people worth and all legitimate factors specific to the operation of the business, including its associated compensation policy and practices. This broader definition of worth could be termed performance worth, reflecting how much value resides in a particular worker performing in a particular job.

Job evaluation systems differ in complexity, and comprehensiveness. While some job evaluation systems are link up with market surveys and contain performance appraisals, others do not. In order to make a meaningful comparison of overall performance worth between employees (and ultimately employee groups), the human resource manager must identify those factors, which are not taken into account by the job evaluation system. These are therefore factors in addition to those reflected in a job worth measure that may legitimately determine the compensation paid an individual performing a specific job for a specific number of hours per week, in a given geographical area, for a specific period

of time, at a specific performance level. A generic list of these factors, which apply to most organisations, are:

- Performance
- Time spent on the job
- Tenure and Experience
- Occupation
- Geography

2.3.5.3.1 Performance

An important goal of compensation is to acknowledge employees' contribution to the organisation and to motivate employees to higher performance. The level at which a job incumbent performs has value to the organisation and must be measured to determine overall performance worth. Performance appraisal was defined by Baird (in Gerber *et al*, 1998, p. 169) as "the process of identifying, measuring and developing human performance." A merit pay policy is a method an employer may use to elicit a higher level of performance from an individual or group of individuals in an organisation.

There are numerous techniques a manager may apply to evaluate a subordinate against performance criteria. The performance criteria must be properly constructed, linked with organisational success.

The rating of employees is often found to be too subjective and therefore vulnerable to a number of biases, prejudices and limitations in appraisal design (Carrell *et al.*, 1998; Gerber & van Dyk, 1998; Smither, 1998). These are discussed later in this section.

In the design of a compensation system, management might deduce system characteristics from any number of theories explaining various facets of employee work performance (Hills *et al.*, 1994). The manner in which individuals are rewarded is therefore designed to influence those behaviours, which determine organisational effectiveness, such as absenteeism, productivity and quality of work (Lawler, 1981). Some of the behavioural theories that might inform the design of compensation systems are the widely documented theory of Maslow's Hierarchy of needs and Alderfer's needs theory, Herzberg's Two-Factor theory, Vroom's Expectancy theory and Skinner's Reinforcement theory (Bergh & Theron, 2003; Gerber & van Dyk, 1998; Weiten, 1997). These theories of human motivation all emphasise the importance of offering the right type of rewards, at the right time, which satisfy individual needs (Lawler, 1981). The compensation system not only is able to influence the behaviour of current employees, but also is capable of managing the flow of employees through the organisation.

2.3.5.3.2 Time

A performance measurement is often a static rating of general performance over a period. Performance has more worth to organisation should the employee perform at particular level over more time. The number of hours worked by an employee must be factored into a compensation equation as a direct measurement of contribution. This is also true of overtime to be paid as per the Basic Conditions of Employment Act (Republic of South Africa, 1997).

2.3.5.3.3 Tenure and Experience

Salary adjustments in line with inflation or other macroeconomic conditions may be implemented in favour of external parity; however, compensation policy may include reward for tenure. Compensation increases of this kind may be ascribed to employee loyalty or an adjustment for experience, where the number of years in a particular position is a proxy for experience gained (which is in turn a proxy for higher performance) (Carrell *et al.*, 1998). Assuming a demand for the particular type of experience, employees who are experienced in the job or at a specific task are usually more productive and therefore able to command higher wages (Mohr & Fourie, 1995).

Following an investigation of compensation policy and possibly a historical account of organisation-wide increases allocated over the past number of years, adjustments for fixed or variable salary increases are possible, in order to compare employees of different tenure in the organisation. This would entail a discounting of salary to remove tenure effects.

2.3.5.3.4 Occupation

Skills and qualifications limit the mobility among occupations. Licensing and certification requirements limit the entry and exit from an occupation. This has an effect on the supply of labour to the occupation. Wage differentials associated with occupation are the most basic as they reflect differences among the workers themselves, the level and kind of skills they possess (Rees, 1979).

2.3.5.3.5 Geography

Markets are limited geographically in the willingness of the prospective employee to relocate or commute the distance to the job. There is an interaction between occupation and skill, as some professions operate in the local market, while some on national level.

The “going rate” is determined by the dynamics of these external labour markets. Labour markets also exist inside organisations, and are even more important to an individual's perception of equity. This internal labour market involves the structure of the compensation system, and it is this labour market with which compensation discrimination is concerned.

The following sections discuss the measurement properties and criticisms raised against job evaluation systems. Cognisant of the fact that the measurement criteria applicable to job evaluation systems also have relevance for some of the other legitimate determinants of overall performance worth discussed above (especially performance evaluation systems), the subsequent discussion must be interpreted where applicable, with the broader definition of worth in mind.

2.3.5.4 Job Evaluation as a Measurement Tool

The spirit of the law implies that the job evaluation system and related measures are assessment tools. They should therefore be shown scientifically to be valid, reliable and unbiased. Section 8 of the Employment Equity Act (Republic of South Africa, 1998) prohibits the use of assessments, which are unreliable, invalid and biased toward any employee or group. In the case of a job evaluation tool, it may be inferred that the Act would also prohibit the use of a procedure should it be biased toward any group of jobs on grounds other than job worth. Moreover, an unreliable and invalid job worth measurement would be useless to the organisation (Muchinsky, Kriek & Schreuder, 1998). To fully appreciate the importance of the psychometric evaluation of the measures of job and person worth, it needs to be understood that these measures function as criterion measures in the analysis of compensation. Measures of job and person worth (and therefore overall performance worth) serve as evaluative standards in terms of which the appropriateness of the compensation paid to a person in a job is assessed. As is true in the case of selection validation studies, if the criterion is suspect, the whole argument in terms of which the human resource intervention is justified (be it selection or compensation) loses its credibility.

2.3.5.4.1 Reliability

Muchinsky *et al.*, (1998, p. 71), defined reliability as “the consistency or stability of a measure.” A measure should yield the same estimate on repeated use, regardless of accuracy. Reliability was defined by Cascio (1998) as the extent to which the measurement is free of unsystematic (random) measurement error, which may be attributed to the test situation. Evidence of the reliability coefficient would be presented in litigation, should the job evaluation system be challenged.

Different reliability coefficients and estimates of components of measurement error can be based on various types of evidence; each type of evidence suggests a different meaning... Thus the estimation clearly labelled components of observed and error score variance is a particular useful outcome of a reliability study, both for the test developer who wishes to improve the reliability of an instrument for the user who wants to interpret test scores in particular circumstances with maximum understanding (The American Psychological Association in Cascio, 1998, p. 88).

Table 2: Error Variances associated with different types of reliability measures (Anastasi in Cascio, 1998, p. 92)

Type of Reliability	Error Variance
Test-retest	Time sampling
Alternate-form (immediate)	Content Sampling
Alternate-form (delayed)	Time Sampling and Content Sampling
Split-half	Content Sampling
Kuder-Richardson and the Coefficient Alpha	Content Sampling and Content Heterogeneity
Scorer	Inter-scorer Differences

A review of reliability coefficients, as displayed in Table 2 reveals some coefficients which might apply to job evaluations and performance appraisals. Typically, an effective job evaluation measurement is expected to obtain the identical measurement of job worth for job content over time (test-retest). The two alternate forms approaches do not apply to job evaluation studies, as two forms are not generally available as in psychometric testing. Much of the focus however falls on the differences between evaluations obtained across scorers. Cascio (1998) explained that scorer variance is minimal with objective measures, but quite often seriously compromised with observational data involving subtle discrimination. A simple correlation between scorers can estimate reliability. South African practitioners usually refer to this form of reliability as inter-rater reliability.

Reliability is not an end in itself but rather a step on a way to a goal. That is, unless the test scores are consistent, they cannot be related to another variables with any degree of confidence. Thus reliability

places limits on validity, and crucial question becomes whether a test's reliability is high enough to allow satisfactory validity (Brown in Cascio, 1998, p. 93).

2.3.5.4.2 Validity

Generally, “validity measures the extent to which a measurement procedure measures what is designed to measure” (Cascio, 1998, p. 100). “Employers develop tests that assess the knowledge, skills and abilities needed to perform a job. How much the content of these tests is job related is assessed by content validation” (Muchinsky *et al*, 1998, p. 72). The traditional link between the job analyses and psychometric test construction for selection could be transposed to include job evaluation and compensation level. The two following aspects of validity are applicable to job evaluation systems:

- Content related validity concerns the representativeness with which the test samples the array of situations it supposedly represents (Cascio, 1998). Cascio (1998, p. 101) listed three assumptions requisite for content reliability:
 - the area of concern to the user can be conceived as a meaningful, definable universe of responses;
 - a sample can be drawn from the universe in some purposeful, meaningful fashion and;
 - the sample and the sampling process can be defined with sufficient precision to enable the user to judge how adequately the sample of performance typified performance.

In the job evaluation context, the measurement must be able to consider all aspects of the job, and measure them in a meaningful manner regardless of how abstract the job dimension is.

Face validity is similar to or can be regarded as a part of content validity, but refers to the appearance or perceived appropriateness of items. Face validity and content validity do not necessarily co-exist. Content validity is estimated by the developers; face validity is estimated by the users. Content validity in this context is determined by requiring both employees and supervisors to specify the job behaviours, from which test items are developed to assess factors that tentatively measure success on the job (Muchinsky *et al.*, 1998).

- Construct related validity in the compensation context, to paraphrase Binning and Barrett (in Cascio, 1998), requires evidence to demonstrate that the measurement tool measures a specific construct that has been shown to be indicative of the value of the job. Cronbach and Meehl (cited in Cascio, 1998, p. 109) stated that:

The construct is not defined by an isolated event but rather a nomological network – a system of interrelated concepts, propositions and laws that relates to observable characteristics to other

observable, observables to theoretical constructs, or one theoretical construct to another theoretical construct.

This is in a sense true of job evaluations and performance measures. Intrinsic worth is the final construct, based the contributed value of the job and the incumbent's performance within a job. This is often only observable only through other constructs such as skills, knowledge and abilities of the job incumbent.

2.3.5.4.3 Bias

Bias refers to the discriminating properties of the measuring instrument. Blum and Naylor (1968) defined bias as the portion of systematic criterion contamination that can correlate with the predictor. In the compensation context, measures are biased if group membership explains systematic variance in job worth measures not explained by the compensable construct, which the measure is meant to reflect.

Grams and Schwab (1985) differentiated between direct and indirect bias.

- Direct bias occurs in a job evaluation when the application compensable factor may influence the measurement of a group differently to that of another. Should this factor have no bearing upon an inherent requirement of the job, illegal direct discrimination occurs. This is illustrated by a case of gender discrimination, as researched by Mahoney and Blake (in Grams & Schwab, 1985), where a job's measurement may be significantly correlated to perceived masculinity or femininity.
- Indirect bias, however, is a speculative source of bias and is contingent on the hypothesis advocated by comparable worth. Here current market wage is biased against women, in a job held predominantly by women, who are systematically underpaid relative to those occupations predominantly held by men. This has only been studied conceptually but there is reason to believe that perceptions of job worth correspond to current wage rates associated with those jobs. (Blumrosen, Treiman & Hartmann in Grams & Schwab, 1985).

False non-discrimination is said to occur in the selection context if the measure of job success is itself biased in the same direction as the effects of group on the predictor performance. A selection measure runs the risk of being used unfairly when one group performs less well than another group on the measure, but performs just as well as the other group on the job for which the selection predictor is designed (Cascio, 1998).

The vulnerability of tests is due less to their limitations for measuring important differences than it is to their very success in doing so... the more valid the tests are as measures of general cognitive ability, the larger the average group differences in test scores they produce. Keeping the spotlight on the tests merely forestalls the real debate – how can this society justly and constructively deal with racial-ethnic differences in ability that will be with us for a very long time to come? (Gottfredson cited in Cascio, 1998, p. 122)

Jensen (in Muchinsky, 1998) realised that the internal psychometric properties of a test may be considered as indicators of bias. The following is paraphrased as applied to a job evaluation:

- **Differential Reliability:** The job evaluation system may show greater reliability for one group of people, one type of job or a gender dominated job group. (This is the major concern of comparable worth advocates).
- **Test-item interaction (by race):** Although this is not direct evidence but rather a betraying symptom of bias, the researcher would expect to find a pattern of differentiation in score across items, which have a bearing on group membership.
- **Differential factor structures:** Factor analysis should identify a biased test by measuring different factors for different groups.

Blum and Naylor (1968), defined three types of bias applicable to this context, particularly in performance appraisals, where a performance measure forms part of a job evaluation system:

- **Opportunity bias:** “Those situations where factors beyond the control of the worker considerably influence the amount produced” (Blum and Naylor, 1968, p. 180). This is portrayed by a factory manager applying performance measurements to a worker whose performance is linked to the speed of a conveyor belt.
- **Group Characteristic Bias:** When the job is one where performance increases with experience gain, it is inevitable that the criterion and experience will be correlated. Any predictor likely to correlate with experience, for example age, will correlate with the criterion with spuriously high validity. This problem is created when proxies are used, which discriminate on grounds not inherent to the job, but against a particular subgroup.
- **Knowledge of Predictor Bias:** If a rater knows the scores, which will be achieved on the predictor variable, it is possible that this will let criterion judgments be influenced by this knowledge. In the job evaluation context, the rater might score senior management higher, based on the information that the senior manager normally earns more than a referent position.
- **Bias in Ratings:** Bias, which is not necessarily linked to group membership, but is a result of the rating process.

Carrell *et al*, (1998) described the seven types of rating bias common to performance appraisals. The performance appraisal score is often included in the determination of compensation level. These rater errors are similarly common for ratings during job evaluations:

- Supervisory Bias: Conscious or unconscious bias not related to job performance or worth and not necessarily related to group bias but stems from personal or job characteristics not inherent to the job, such as proximity, friendship or athletic ability.
- Halo Effect/Devil Horns: A rater allows one aspect of employee performance or job worth to influence other aspects.
- Central Tendency: A rater may avoid unpleasant emotions or reciprocation by evaluating everyone as average.
- Leniency: Similarly a rater may give high evaluations to an entire group, even though the appraisals are not accurate.
- Strictness: A rater may give consistently low ratings (the opposite of leniency).
- Recency: The timing of events, job behaviours or individual performance may result in inaccurate ratings.
- Overall Ratings: Many appraisals require a general rating. It is difficult for a rater to combine many separate job or performance dimensions into a composite appraisal score.

While the growing use of formal evaluation systems is certainly a boon for anti-discrimination advocates, heralded as the proverbial light in the darkness, they are subject to numerous vulnerabilities. If not chosen and applied correctly, they will do more harm than good.

2.3.5.5 Criticisms levelled Against the Use of Job Evaluation Systems

While the issue of relative worth centers on the merits of the job evaluation systems, it must be noted that much criticism has been directed toward their use, particularly in South Africa. The resistance to job evaluation has arisen from the history of its use which is associated with racial and political underpinnings. Their link with salary surveys stands as an example of how, in the past, capital has combined to maintain power of the labour market. They are therefore perceived as a threat to collective bargaining as an alternative method for wage determination and subject to criticism (Perold, 1985).

Cowan (1985) questioned the use of commercial job evaluation systems and argued the following criticisms in terms of their reliability and validity:

- The use of a single criterion such as level of decision making as a sole conceptualisation of job content lacks face validity (as in the Patterson system); the measurement is liable to be unreliable if rigid procedures are not adhered to.
- There is a reliance on subjective judgments and therefore are too elaborate (as in the Peromnes system).
- The jobs on a continuum are arbitrarily graded into pay grades.
- Cowan (1985) also leveled criticism at multifactor systems that find difficulty or lack logic to explain how different factors are weighed up against one another. This issue was discussed by Spryridakos, Siskos, Yannacopoulos and Skouris (2001) and concerns a larger field of multi-criteria decision support.

Shwab (in Arnault, Gordon, Joines, & Phillips, 2001) identified similar problems:

- There is no substantiation that job evaluation systems relate to job worth (which has bearing upon construct validity).
- Consensus of the term job worth as not been reached. This argument suggested that the job evaluation is a hedonistic price model that can only be used to evaluate jobs for which market values are absent.

Aaron and Lougy (in Arnault *et al.*, 2001) argued against the use of job evaluation systems with similar reasoning to that employed by market wage advocates. The argument claims job evaluations have been used to remove anomalies from wage structures otherwise found to be acceptable by the market in the interests of aligning the job worth within the organisation.

During the late seventies, the Equal Employment Opportunity Commission in the United States, explored the idea of comparable worth and submitted two volumes entitled “Job Evaluation: Its role in the Comparable Worth Debate,” (Bellak *et al.*, 1983, p. 420.) The first publication referred to as the Treiman Report, found three features problematic to the application of the job evaluation in a segregated work force.

- Firstly, the relative ranking of jobs tends to be change dependent upon which factors are used in the evaluation and how heavily each factor is weighted.
- Secondly, job evaluation is inherently subjective, making it possible that well-known processes of sex-role stereotyping will be operative in this context as well.

- Thirdly, employers using several job evaluation systems, rendering the comparison of jobs in different sectors of the organisation an impracticable thereby making it impossible to compare the worth of jobs in different sectors of a firm.

Multiple studies have shown that job evaluation ratings often show a low to moderate interrater reliability, multiple methods fail to converge and even in cases of high reliability and convergence classification agreement is not ensured. (Cowan, 1985). Some studies have shown that prevailing wages in the labour market can influence job evaluation ratings. Should the above be true, the function of job evaluation systems is redundant (Grams & Shwab, 1985; Hollenbeck *et al.*, 1987).

The implications of the above are that firstly, job evaluation may, in some organisations, prove an obstacle in the implementation of comparable worth policy and secondly, although the Peromnes system has been tentatively accepted as evidence in a South African court (Louw versus Golden Arrow Bus Services, 2000), its nature and capability as a measuring tool has not been challenged. Until such time as job evaluation systems are formally disputed and ruled upon in court, the profession has an uncertain starting position in the design of compensation systems and tools whose very foundations are open to challenge. Fortunately, distributors of job evaluation systems are equipped with validation and reliability information to defend their products on behalf of their clients.

Despite criticism, the above mentioned job evaluation systems are the best available means to measure most of the constructs within the job which comprise worth. Despite being fraught with difficulties, it certainly is possible should the job evaluation systems be founded upon consultation and agreement between employers and trade union organisations. The approach of comparable worth is certainly a desirable concept fitting the comprehensive South African Constitution and national culture.

Job evaluation and its related measurements, however fail to present the entire picture to the court. The following section introduces another ingredient of successful evidence.

2.3.6 Compensation Fairness in Context

Consideration must be given to the context in which the compensation system operates. Chapter 2 of Promotion of Equality and Prevention of Unfair Discrimination Act (Republic of South Africa, 2000) states that fairness is to be evaluated within context, a view on compensation fairness supported by Conway and Roberts (1983), Grogan (1996), Landman (2000) and Pinder (1998).

Although the evaluation of context is case and organisation specific, and could even extend to interpersonal relationships, the nature of the organisation's relationship with the union or perhaps preceding acts of overt discrimination; this thesis identifies five generic areas worth consideration. These are the organisational strategy (and its derived business needs), organisational culture and climate and the maintenance of external equity, other legal constraints and collective bargaining.

2.3.6.1 Alignment with Organisational Strategy

The organisation attempts to design a compensation system, which compliments and enhances organisational strategy. There are a number of factors, which must be addressed when establishing payment levels and structures. In short, management searches for a fit between employee needs, organisational goals and environmental pressures. Management addresses the characteristics of the organisation, internal and external forces that influence payment levels, together with secondary sources of information on compensation trends (David, 1997; Hume, 1995).

Lawler (1981) established that compensation is the most powerful tool available to management to affect organisation change and development. Compensation may be aimed at contributing to group effectiveness and organisational change. The compensation system has important bearing upon organisational effectiveness as:

- The compensation system is able to enhance business strategies. According to Milkovich and Newman (1993), the compensation system is able to reinforce organisation and business strategies. The organisation may link compensation practices to the achievement of goals and objectives.
- As mentioned before, compensation plays an important role in organisational development practices (Lawler, 1981).
- Should management, in the design of the compensation system, lack consideration for the context within it operates; they may render the system ineffective and create conflict. Organisational effectiveness depends on achieving a congruence with the multiple and interactive systems within the organisation. "Different systems in the organisation suggest different behaviours and needed coordination is not present because employees receive conflicting messages and how the organisation regards them" (Lawler, 1981, p. 156).

Management therefore seeks harmony between organisational structure in terms of organisational maturity, business units, management levels, centralisation, technology, information systems, compensable tasks within the organisation and the needs of the employees. Compensation systems are closely linked to relationships, job design, job structure, management training and development, information and control systems, and management philosophy or style (Lawler, 1981). The following paragraphs outline organisational culture and climate, which are not only associated with effective business strategy but also interdependent.

2.3.6.2 Alignment with Organisational Culture and Climate

Organisational culture refers to the pattern of beliefs resulting from group norms, values and informal activities (Donnelly, Ivancevich & Gibson, 2000). Schein (in David, 1997, p. 143), defined organisational culture as:

A pattern of behaviour developed by an organisation as it learns to cope with its problem of external adaptation and internal integration, that has worked well enough to be considered valid and to be taught to new members as the correct way to perceive, think and feel.

Fobrum (1994) explained that corporate culture moulds the way employees view the world and the environment, and perceived differently by employees belonging to different corporate cultures. It is important that compensation system reflects the organisations culture and values (Milkovich & Newman, 1993). The employees of the organisation must accept the system, and ascribe to its values.

Litwin and Stringer (in Nasser, 1975) defined organisational climate as a set of measurable properties of the work environment, which are perceived directly or indirectly and influence their motivation and behaviour. Schneider (in Stetzer & Morgeson, 1997) noted that organisational climate focuses on how organisations function while culture addresses why they function in a certain way. Lin (1999) held that organisational climate is the shared perceptions about organisational conditions, while organisational culture is the shared assumptions and values by the group members as culture is a learned process and unlike climate maybe totally absent in new organisations.

Organisational climate is essentially an evaluation of the work environment and so determines job satisfaction (Al-Shammari, 1992). It is important for management to design a compensation system to build job satisfaction. A compensation system must be conducive to organisational culture and when required, the most important instrument if organisational change and development initiatives. Utility is

drawn from understanding how employees perceive the reward, and reward in the context the organisation. Pay practices are unlikely to be successful in an organisational climate, which does not support its values. As a result, the culture and climate of the organisation may also serve as both a leverage factor and an impediment in the design of the effective compensation system (David, 1997; Lawler, 1981).

Compensation influences employee behaviour to develop desired organisational culture and manage organisation climate, building on desired elements, which positively affect business strategy. Compensation is therefore vital cog in the interplay between organisational strategy, culture and climate, and therefore must be considered in the context of the latter. The court therefore could view evidence describing organisational culture, climate and strategy as adding to the meaning of compensation and compensation differentials within each organisation.

2.3.6.3 Internal versus External Equity

One of the key issues of a compensation strategy is the maintenance of both internal and external equity. This requires evaluation of the situation presented by both the internal and external labour markets.

External competitiveness was defined by Milkovich and Newman (1993, p. 190), as “the pay relations among organisations – the organisation’s pay relative to its competitors.” In the discussion of external labour markets, Milkovich and Newman (1993, p. 190) defined pay level as “the average of the array of rates paid by an employer.” The higher the compensation levels, the easier it is to attract and retain a qualified workforce (Rynes & Barber in Milkovich & Newman, 1993). However the higher the labour costs, the greater the relative costs to produce similar products to the competition.

Essentially employers must bid for labour in various labour markets, in the attempt to attract the most qualified labour. The market rate is formed by what other employers in the labour market are prepared to pay to recruit employees with similar skills, abilities, qualifications and experience (Hills *et al.*, 1994; Hume, 1995). The external labour markets differ in payment trends between geographical location, industry, business area and occupations or professions. The nature of the external labour market changes over time and it is important that the employer be aware of these changes in order to remain competitive.

Employers choose to pay relative to the competition, paying higher or low than the market. In doing so, the employer is said to practice a lead, matching or lagging pay policy (Milkovich & Newman, 1993). As decisions to pay higher or lower than the market can be justified, employers may set different pay level for the same job. The notion of a single, homogenised labour market is a naïve assumption, as reality would have organisations operating in many labour markets. The manager must define relevant markets to link those factors in the market to the appropriate pay level.

Consistency in the internal labour market, the organisation's own pool of employees, indirectly influences efficiency and effectiveness of the organisation by way of its effect on the employees' motivation or behaviour. Employees are allocated positions in the organisations, which represent differing levels of worth to the organisation. The compensation system attempts to arrive at internal consistency in the comparisons among jobs and skill levels in terms of their relative contributions, inside an organisation (Milkovich & Newman, 1993). The internal labour market is represented by the relationship of all positions in the organisation. There may be more than one job in a particular position.

The movement into higher-level jobs with a higher level of compensation is governed by policies and practices within the organisation. An internal labour market is also open to the external labour market *via* recruitment into positions in the hierarchy. Organisations may have more than one internal labour market depending on the type and level of skills required. They may exist points of transfer between labour markets within an organisation. For example, acquirement of skills may move an employee from an unskilled to a skilled labour market or a transfer between departments (Hills *et al.*, 1994)

According to Lawler, (1981) both forms of inequity have dire consequences on the organisation: External inequity consequences of labour market competitiveness, are the most severe to the organisation and therefore usually the focus of primary attention. The legislation seems to be apathetic to the organisation's need for external equity in the labour market. Striving for both internal and external equity can create another type of problem. Situations may arise where individuals are overpaid in terms of the external labour market because the internal method of determining income (a job evaluation system) requires that the position be paid relative to other positions in the organisational hierarchy. In this case, the organisation could pay too much or too little for the same labour compared to all competitors for that individual (or unit of labour). By paying too much, the organisation may become overpriced of the product market. That is, the organisation could price its good or services, out market in order to comply with legislation. By paying too little, the organisation fails to attract and

maintain employees. Furthermore, while internal equity is business specific, external equity applies to all the organisations operating the market for the individual's labour, (who do not necessarily operate in the same product market) and must operate in a range of product and labour markets, while maintaining internal and external consistency.

The legislation provides that differences between job grades be proportional to the compensation. At this stage, it is important to note that the maintenance of internal equity and external equity are often mutually exclusive. In order to operate effectively, organisations must strike a compromise between these two markets. Equity legislation (and the court) cannot directly reign in the external labour market under capitalism, and therefore has settled for interventions by organisations, blind to their fairings in the external labour market.

The market wage has been proven to contain elements of illegal discrimination (England, 1992; Stanley & Jarrell, 1997). Theoretically, it only takes one bigoted organisation to influence the labour market, through a market pay survey. A more likely scenario involves such concepts as group specific occupational preferences (Hollenbeck *et al.*, 1987; Lapidus & Figard, 1998) and job segregation (Blumrosen, 1979; England, 1999; Gunderson, 1994a).

This strikes an issue raised by Milkovich and Newman (1993) as to whether organisations can realistically be expected to operate outside of the external labour market in order to ensure compliance, even though such a policy could lead to financial demise? Should the South African courts follow suit of the hotly debated, American case of Spaulding versus University of Washington (1984) – the courts must give way to the machinations of the external labour market. Norris (1983) argued that this results in an inadequacy in the legislation, in those employers who do not use job evaluations; blaming inequities on neutral market forces are less liable. This however contradicts the rationale of legislation, which, seeks to regulate the imperfect free market system by imposing social values and notions of fairness (Hume, 1995).

2.3.6.4 Legal Constraints

Government can affect wage differentials by restricting the entry into certain occupations. A license or certificate is required to enter certain occupations. Similar restrictions may be enforced by professional bodies and trade unions (Mohr & Fourie, 1995).

Those at the lowest end of the wage structure often deal with concepts such as basic needs, minimum living levels, and living wages and as a result, minimum wage is an emotionally laden issue. Minimum wages are advocated on the grounds of avoiding exploitation and ensuring a standard of living (Mohr & Fourie, 1995). Government may also put in place trade duties and tariffs in attempts to regulate the local economy (which may only be applicable in one product/labour market in a large organisation).

In terms of labour market regulation, the legislation seeks to directly counteract the will of the profit-seeking organisation by placing price ceilings and floors. This has effects on other labour markets and occupations. A simple hypothetical scenario illustrates this point: An organisation employing both unskilled farm labourers protected by minimum wages regulation; and skilled bricklayers. The labour market might deem bricklayers to earn the same as the minimum wage of farm labourers, who would usually earn much less. In a sense, this conflicts with the universally accepted principle of equal pay for equal work. At the very least, an organisation is set a difficult task in designing a compensation system. Although examples of market regulation causing paradoxes or inconsistencies are numerous and fall outside the scope of this thesis, the realities of competitive market wages conflict with regulations imposed by legislation. The court is required to assess the impact of market regulation on the organisation in determining whether the organisation could reasonably be found to be discriminating against an employee group.

2.3.6.5 Collective Bargaining

Workers who have little or no bargaining powers form trade unions, which can serve as a countervailing force to the bargaining power of employers (Mohr & Fourie, 1995). One of the greatest influences on compensation level and method result from negotiation with employee representative groups. “Collective bargaining is a process of joint negotiation between employer and trade unions... regarding all aspects of the employment relations” (Hume, 1995, p. 101).

Under the Labour Relations Act (Republic of South Africa, 1995), organisations are required to bargain or negotiate with employees or union representatives on conditions of employment. Labour unions have an impact on compensation systems, wage levels, wage structures and benefit increases (Hills *et al.*, 1994). Research has suggested unions narrow the overall wage structure both within organisations and for workers within a bargaining unit (Freeman in Hills *et al.*, 1994).

Unionised organisations or bargaining units are more likely to pay a job a single rate instead of using pay ranges of merit pay. Unions also seek to enhance the benefits of their members relative to non-members, asking for pension plans and severance pay (Hills *et al.*, 1994). (Bhorat, Leibbrant, Maziya, Van der Berg & Woolard, 2001) held union activity to be one of the strongest role players in reducing the wage gap. However, it is also important to regard professional boards as having similar goals within the economy. Such boards regulate occupations and in doing so protect the interests of members in those occupations. These, practices often restrict supply into professional occupations, placing upward pressure on the wage rate.

There however, lies great difficulty in analysing the effect of union activity upon the wage level, as it is impossible to judge the wage level without the presence of the union owing to the practice that union benefits are extended to all employees. The direct effect of unions on non-union earnings is known as the threat effect, by which a successful organisation of non-union employees will experience a threat should their wages lag. When comparing union and non-unionised environments, in the same industry and locality, the comparison will be underestimated. It is however possible to compare estimating earnings as a function of percentage of workers covered by collective bargaining. There is reason to suppose that the effect is non-linear (Rosen in Rees, 1979). Unionisation causing a relative change in wages in one sector may increase the supply to that sector, which tends to check the rise of wages. Union effects on relative earnings, are influenced by the extent of their power and organisation, differences in the type of union (industrial versus craft) and by the level of skill of the organised employees due to differences in the respective elasticities of demand – and the possible effects of strike action on the organisation (Rees, 1979).

Little has changed since early compensation studies, when Elliot (1956) explained that the human resource manager is required to balance the job incumbent's expectation of receiving a just and fair return for work performed with the fitting of this just and fair payment in a general wage structure. This implies firstly that there is certain parity for services rendered and equity within the broad compensation system, and secondly, the compensation structure must take into account its consequences on individual and collective behaviour, and organisation climate, culture and strategy (Al-Shammari, 1992; David, 1997; Hume, 1995; Lawler, 1981; Milkovich & Newman, 1993). Coupled with the above, are the financial considerations of developing and maintain a sound and legally compliant compensation system while still managing labour costs (Tromp, 1983).

The Promotion of Equality and Prevention of Unfair discrimination Act (Republic of South Africa, 2000) evaluate *de facto* equality in deciding whether the litigant has met the burden of proof. Before introducing the burden of proof, it is necessary to refine the concept of *de facto* fairness.

2.3.7 De Facto Fairness

Job evaluation systems and their related measures can be evaluated in terms of measurement properties, and can be shown statistically to be reliable, valid and unbiased (Duvenage, 1990). Fairness, however, is not a property, or result of a measuring instrument or predictor, but the account of all the variables which play a role in the eventual outcome. Therefore, the study of fairness refers not to the measurement but how the organisation applies or interprets these measurements in the determination of compensation level (Muchinsky *et al.*, 1998).

Fairness has been extensively studied in the context of employee selection (Arvey & Faley 1988; Cascio, 1998; Peterson & Novick, 1976). From this it may be gleaned, that fairness is not exclusively a psychometric or statistical construct, but one that is influenced by social and political thought (Cascio, 1998; Muchinsky *et al.*, 1998). Fairness is a value judgment, which cannot be scientifically proven (Murphey & Davidhofer, 1988).

Should every organisation be identical in every conceivable way, operate in the same perfect market, where labour is homogenous, it could be expected that the optimum compensation practices would be standard, and used throughout the economy. Under these conditions, it would be theoretically possible to define operational fairness and benchmark evidence accordingly, comparing across cases, settling at nothing less than equal regression coefficients between groups. Unfortunately, the concept of fairness does not lend itself to this operational blueprint, which, when transposed across employment situations, renders an unambiguous verdict on fairness.

The solution nonetheless does lie in a generic and objective concept of fairness. In order to prove fairness it is necessary to assign one definition of fairness for the assessment of compensation systems. That is in order for the judge to decide whether a compensation system is fair, it is necessary to offer the judge a general description of how a fair compensation system should appear. Grogan (1996) and Landman (2000) are of the opinion that because fairness is a complex concept, it must be evaluated in its context and in relation to its purpose. This is as stated in Chapter Three of the Promotion of Equality and Prevention of Unfair Discrimination Act (Republic of South Africa, 2000), which

requires the judge to take into account the context, whether the differentiation between persons is reasonably and justifiably according to objectively determinable criteria, intrinsic to the activity concerned. Among others, the impact upon the applicant and the position of the applicant in society, the nature, extent of discrimination, and whether the discrimination is systemic, are included in Subsection three of that chapter. Discrimination, equated in the Act (Republic of South Africa, 2000) to adverse impact, and not unfairness. The court must take into account contextual factors when determining in order to examine fairness. Cognizant of the fact that the law reflects societal notions of fairness, the court must rely on social norm - a perception likely to change over time and situations. No definition therefore exists to precisely define fairness in the worth context.

Conway and Roberts (1983, p. 78) resigned to state that, "There appears to be an implicit assumption that discrimination is easier to recognise than to define." For this reason, there is little consensus over the true operationalised version of fairness, and therefore have different implications to different role players. Litigation nevertheless requires objectivity and consistency, and by the same token, the human resource profession requires one model by which to operate.

Generally, a model of employment discrimination holds that illegal discrimination is present if group membership influences, either implicitly or explicitly in the employer's decision-making process in a manner that can not be accounted for by legitimate factors. As fairness refers to the outcome of the process, illegal discrimination is present should group membership shape the position of the relative pay curves beyond the position that would have resulted due to legitimate factors. Regardless of how organisations select, promote and transfer employees, once all legitimate factors are taken into account, a systematic difference in compensation can only occur if another factor not related to job and possibly related to group membership, has been used to determine compensation (Weisberg & Tomberlin, 1983).

The best definition may arise by paraphrasing Guion (in Cascio, 1998) where this form of unfairness could be defined as existing when persons with equal measurement of overall performance worth have unequal probabilities of obtaining the same compensation. In the comparable worth context, the scope of this definition may broadly define fairness as existing when persons with who contribute comparable to the organisation have unequal probabilities of obtaining the same compensation.

It may therefore be argued that, while it is established that the court infers fairness in the consideration of the above, a court nevertheless requires a model of fairness as a point of reference, across court

cases. The judgment of the court is one based upon the assessment offered by a model of fairness before the consideration of the mentioned factors. That is, a societal model of fairness and what fundamentals constitute a fair outcome.

This concept should be one permitting either positive vindication or culpability of the compensation system, devoid of subjectivity, politics and partiality. There lacks a formal operational definition of how to define the manifestation of discrimination in organisations. It is however clear that the concept is dealt with by statistical evidence (Conway & Roberts, 1983). The inference of discrimination in a regression analysis is dependant on which measures of overall performance worth are introduced. The concept of fairness and therefore operational definition thereof differs from case to case and no court is able to describe fairness save for describing an interpretation of a fairness model, in light of the nature of the organisation's compensation practices and other forthcoming evidence.

Discrimination and fairness are interrelated concepts, discrimination cannot be dealt with, save for determining fairness, a concept evaluated in terms of its context (Conway & Roberts 1983; Grogan, 1996). This must then also be true of the statistical perspective on fairness and discrimination. Here, fairness as an objective, statistical concept is not divorced from the reasonable expectations of organisations and its employees, but it does not deal with perceived equity, or feelings of unfair treatment.

The evidence required to satisfy the court must also be modeled to how the court requires fairness to be proven. An equally important uncertainty lies in the nature of the burden of proof in the context of compensation discrimination. It may be construed that the question whether evidence will leap the court's hurdle also lies as much with the level of evidence as in height of the hurdle.

2.4 THE BURDEN OF PROOF

"First thing we do, lets kill all the lawyers"

Shakespeare, Henry VI

While most countries have been struggling with the difficulties of discrimination law for the past forty years, South Africa is only now beginning to explore the burden of proof; a concept which has been held to be the most controversial and debated procedural subject in discrimination law (Dupper, 2002). In addition to this, these legal systems recognise a limited number of grounds upon which discrimination can take place, namely, race and sex (Manley, 2002); South Africa boasts eighteen

listed grounds upon which discrimination is forbidden. The criticalness of the subject is emphasized by the fact that the burden of proof in employment discrimination cases often determines the outcome of litigation (Dupper, 2002).

Hoffman and Zeffert (in Landman, 2002) used the term, as a metaphorical expression for the duty one of the parties must bear in order to satisfy the court in claim or defense. The burden of proof raises the questions:

- who should rightfully bear this burden;
- when this burden must be carried;
- the nature of the evidentiary risks; and
- what evidence will satisfy a court.

The concept differs from evidentiary burden as the former entails firstly, producing evidence to combat a *prima facie* case of the opponent and secondly the producing of evidence to escape procedural consequences (Dupper, 2002).

2.4.1 The Balance of Probabilities

Judgments in cases of discrimination, and whether the parties have succeeded to carry the burden, lie in the abstract scales of the balance of probabilities. Lord Denning (cited in Skeen, 1997, p. 404) described the burden such that:

It must carry a reasonable degree of probability but not so high as is required in a criminal case. If evidence is such that the tribunal can say “we think it is more probable than not” the burden is discharged, but if the probabilities are equal it is not.

Simon (cited in Eggleston, 1983, p. 132) pointed out that this legal concept of probability is underlain by, “the burden of showing odds of at least 51 to 49 that such-and-such has taken place...”

The central difference referred to by Eggleston (1983) between the standard of proof in England and Australia with the United States is that, while the former countries determine persuasion on the balance of probabilities, the United States applies the preponderance of evidence. South Africa follows former, the balance of probabilities approach.

Of the more enlightening descriptions in the literature, was Dixon who stated (cited in Eggleston, 1983, p. 132):

The seriousness of an allegation made, the inherent unlikelihood of an occurrence of a given description, or the gravity of the consequences flowing from a particular finding are considerations which must affect the answer to the question whether the issue has been proved to the reasonable satisfaction of the tribunal.

The judge is required to decide which of the litigants evidence is more likely. The question being, “when will the burden be shifted?” The appropriation of the burden, however, determines what type of evidence will shift the burden and this is discussed in the following section.

2.4.2 The Shifting Burden

The shifting burden came to the fore in McDonnell Douglas Corporation versus Green (1973) where the United States Supreme Court resolved most of the questions surrounding the burden, which to date had hampered proceedings. The procedure, known as the tripartite or the three-stage approach, was established as follows (Landman, 2002):

- the *prima facie* stage
- the burden of production
- the pre-text stage (in cases of direct discrimination).

Each of these burdens is discussed below. The appropriateness of this staged approach in terms of disparate treatment and impact, and the role of statistics, will then be discussed.

2.4.2.1 The prima facie Stage

The *prima facie* stage may be considered loosely as: serving to assist the plaintiff who cannot produce sufficient evidence with which to prove a case. The *prima facie* stage is not merely an allegation, but is supported by a certain level of evidence. The plaintiff must raise at the very least an inference of discrimination, giving the court enough reason to wish to investigate.

The nature of this *prima facie* evidence is flexible to the situation (Dupper, 2002).

...the facts are within the peculiar and intimate knowledge of one of the parties. It is not a principle in law that the onus should, for the sole reason of such knowledge, rest on him. The ordinary principles must be applied, but less evidence will suffice to establish a *prima facie* case (Skeen, 1997, p. 403).

The question whether the plaintiff is entitled to a *prima facie* case may be determined to the extent to discrimination is difficult to prove. The “launch pad” has no further implications for further proceedings, save to determine how the defendant should respond, as a *prima facie* case is one of

“incomplete” evidence. Once established, a *prima facie* case is therefore not considered a proof of discrimination but only a vehicle with which to raise inference to that effect.

The *prima facie* case, according to Skeen (1997, p. 404), is tested as:

...whether the party who has not yet led any evidence runs the risk of judgement being against him if he leads no evidence to combat the evidence. It does not mean that judgement will automatically be given in favour of the party who has established the *prima facie* case if no contrary evidence is led.

This understanding was developed in *Texas Department of Community Affairs versus Burdine* (1981), where the court held that once a *prima facie* case has been established, the judge believes the plaintiff's evidence and the defendant remains silent on the issue, the court must find in favour of the plaintiff (Dupper, 2002).

2.4.2.2 The Burden of Production

Should the plaintiff raise a presumption of discrimination, showing a sizable disparity, the burden of proof shifts to the defendant who attempts to present legitimate reasons for the differential (Dupper, 2002). The defendant must offer a legitimate reason for the discrepancy, submitting evidence to rebut the presumption of the plaintiff, that is, the compensation system is not affected by group membership. “To accomplish this, the defendant must clearly set forth, through the introduction of admissible evidence, the reasons... Both the credibility and objective accuracy of the reason put forward by the defendant are irrelevant” (Dupper, 2002, p. 1148).

The burden calls for the all the defendant's arguments for the plaintiff to challenge, as was termed the burden of production in *Texas Department of Community Affairs versus Burdine* (1981), (Anonymous, 1996). As such, this stage is often treated a mechanical formality, because the defendants (unless silent) will always prevail (Dupper, 2002). In *Texas Department of Community Affairs versus Burdine* (1981), the court held that:

Placing the burden of production on the defendant thus serves simultaneously to meet the plaintiff's *prima facie* case by presenting a legitimate reasons for the action and to frame the factual issue with sufficient clarity so that the plaintiff will have a full and fair opportunity to demonstrate pretext (cited in Dupper, 2002, p. 1148).

Once the employer has satisfied the court, the burden shifts back to the plaintiff with whom the ultimate burden of persuasion remains (Anonymous, 1996).

2.4.2.3 The Pre-Text Stage

Once the defendant has forwarded reasons, the applicant is afforded the opportunity to show that the defendant's reasoning is merely a pre-text or excuse for underlying discriminatory motive, concealing illegitimate discrimination or an illegitimate reason to discriminate. In order to prevail the applicant must prove that the defendant is not only guilty of isolated incidents of discrimination but also that discrimination is a pattern or practice (Dupper, 2002; Landman, 2002; Norris, 1987).

There remains much controversy over the role of this stage plays in summary judgments. There lies uncertainly to the relation it has with the *prima facie* stage, the meaning is carries if proven in combination with the first stage and the weight which may be attributed when the plaintiff is only able to show pre-text. Carrying the pre-text only burden, the plaintiff essentially attempts to catch the defendant lying about the reason for discrimination. This stage is important as in some cases; this may be the only manner in which to trap the employer into revealing discrimination (Dupper, 2002). Until the American case, Saint Mary's Honor Centre versus Hicks (1993), the plaintiff need not produce evidence to win the case, but show that the defendant's reason is incredible. This changed in some courts when the Supreme Court became divided on the issue. The court questioned whether the shifting burden is indeed relevant, instigating doubt as to whether a court may find in favour of the applicant based on the pre-text stage alone, to which some courts, namely the Fifth circuit, have subscribed (Anonymous, 1996).

The South African case, Pillay versus Krishna (cited in Skeen, 1997, p. 400) confirmed that the burden of proof, "always lies on him who takes action. If one person claims something from another in a court of law then he has to satisfy the court that he is entitled to it."

2.4.3 The "Stationary" Burden

Landman (2000) in Louw versus Golden Arrow Bus Corporation accepted the notion of *prima facie* burden and referred to Leonard Dingler Employee Representative Council versus Leonard Dingler (Pty) Ltd & others (1998) where the court found (Landman, 2000, p. 202):

Applicants in discrimination cases will be faced with serious and possibly insurmountable difficulties if they are required to prove discrimination.... It is doubtful the legislature intended this... Given the considerations of legitimacy and rationality must be measured in testing fairness, it is the employer

who can provide this explanation. The employer must show that the object of practice or policy is legitimate and that the means used to achieve it are rational and proportional.

Allowing for the *prima facie* launching pad should be seen as an attempt to readdress the power imbalance, which exists in the employment relationship. That is, the court wishes to place each party on equal footing in a courtroom. This should mean that should all employee information, knowledge of the compensation system and practicalities be known by the applicant, (and should the applicant's evidence not require currently inaccessible knowledge and information,) the applicant does not require or deserve the benefit of a *prima facie* case. The judgment in this matter is left to the court. From the defendant's perspective, an open and communicated compensation system may effectively rob the applicant of the *prima facie* benefit, and avoid unnecessary litigation. From a theoretical standing, a transparent compensation system is far less likely to cause feelings of inequity (Lawler, 1981). In the cases of residual discrimination practice, the applicant might require all compensation information throughout the organisation, in which case the usual confidential nature of this information, would only allow the applicant to make a *prima facie* case. The Constitution (Republic of South Africa, 1996) has important bearing on *prima facie* cases. Subsection 32(1)(b) entitled the Access to Information, states that everyone has the right of access to information that is held by another person and that is required for the exercise or protection of any rights. This was implemented by the Promotion of Access to Information Act (Republic of South Africa, 2000). A *prima facie* case attempts compensates for information about the compensation system, which is inaccessible to the applicant. It can be argued that the employee is often communicated the components of the compensation system, and therefore having access to all the required information will, should illegal discrimination be present, be in a position to prove discrimination without the benefit of a *prima facie* launching pad. The more information is made available, for example, the demographic profile of the workforce superimposed on the organisational chart, and performance worth score, the less "benefit of the doubt" should be given to the applicant. This protects the legal system from frivolous and unnecessary cases. However, the employee is not expected to understand the nuances of the operation of the strategic organisation, nor possess all the knowledge and training of those in the management profession who design and operate the compensation system

Judge Landman however rejected the above-mentioned American three-stage recognising the shifting burden to be inappropriate to the South African situation. Landman (2000, p. 202) wrote:

I do not think it will be helpful to go down the American Road of the burden of production particularly where the applicant in a claim involving residual unfair labour practice need not prove intention. The burden of production seems to involve the setting up of a skittle which if knocked down may have no

appreciable effect. Nor is a consideration of the shifting onus useful. Our law appears, correctly, to have turned its back on piecemeal adjudication and the shifting sand of onuses.

In addition to the above, Judge Landman chose not to apply the three-stage approach for the following reasons:

- The second stage, during which the defendant produces legitimate reasons for difference in treatment, is relatively easy to carry as only reasons are submitted and no evidence is required to show that these reasons do indeed cause differential treatment.
- The applicant² need not prove intention in residual unfair labour cases under this approach.
- The court only makes a ruling after all three stages are complete regardless of the order in which the evidence is presented, and therefore little use can be found in a shifting burden.

Louw brought a case of unfair discrimination in compensation against Golden Arrow Bus Services (Landman, 2000) in terms of the Labour Relations Act (Republic of South Africa, 1995). The shifting burden is not mentioned or implied in Schedule 7 of the Labour Relations Act (Republic of South Africa, 1995). This schedule, however, was replaced by legislation, which does refer to it (Employment Equity Act, Republic of South Africa, 1998; Promotion of Equality and Prevention of Unfair Discrimination Act, Republic of South Africa, 2000). It is therefore unclear as to whether Judge Landman in Louw versus Golden Arrow Bus Services (Landman, 2000), intended the repudiation of the shifting burden to apply to the manner in which South African compensation litigation should proceed, regardless of under which Act the applicant claims discrimination. The above cited “American road” commentary seems to confuse matters. The influence of Landman’s judgments on future litigation is debatable as it is unknown whether future judges may still take direction from Judge Landman’s stance on the issue, given replacement of the new legislation.

Another judge of the same namesake, acknowledged this issue, (Landman 2002) and entered the debate reminding the courts that the shifting burden of proof is, in fact, not a procedural device (Hay in Landman, 2002) as was described by Dupper (2002). This means that:

Because the burden of proof including, most often, the onus of rebuttal, is a matter of substantive law, the burden of proof may change depending on which statute the grievant relies... the situation becomes more complicated, and the results even more peculiar, where there is consolidation of applications falling under different statutes, where the burden of proof in regard to the same facts rests upon different parties (Landman, 2002, p. 1135).

² The term applicant is the South African terminology of the American equivalent of plaintiff.

Landman argued that the burden of proof should change, as discrimination is difficult to prove (Landman, 2002, p. 1135):

The result is that legislatures take note of this state of affairs and expressly tailor the burden of proof to ease the burden which would otherwise rest on the grievant. At the same time the legislatures must balance the interests of the respondent and not encourage litigants to pursue obviously baseless claims.

Although the question as to the relevance of the three-staged approach remains unresolved, Landman (2002) argued that according to Garbers (in Landman, 2002) and Kruger (in Landman, 2002) the Employment Equity Act (Republic of South Africa, 1998) does reopen the door to the three-staged approach. Chapter 2 of this Act, states that whenever unfair discrimination is alleged in terms of this Act, the employer against whom the allegation is made must establish that it is fair. It can be argued that within the framework of employment discrimination, this is a reference to *prima facie* evidence. Landman (2002) found the subsequent, Promotion of Equality and Prevention of Unfair Discrimination Act (Republic of South Africa, 2000) to be palpable support for the establishment of the three-staged approach in legislation.

The staged method in the logical continuation and compliments of the *prima facie* stage allowing the court to portion off important arguments, clarify positions and gain direction due to its inherent structure and flow. The staged approach filters out irrelevant argument, allowing defendants to firstly combat the particular inferences, which established the *prima facie* case, rather than swamp the court with irrelevant evidence. The applicant is similarly allowed the opportunity to respond to the defendant's evidence, a necessity in the often-shrouded practice of compensation. The parties are therefore focused on specific battles and need not shower the court with as many arguments as possible - in order to cover the argument, which the judge finds significant. Without a structured process, the judge is likely to be overwhelmed by many convoluted and comprehensive arguments. Most importantly, the staged approach enables the court to distinguish a *prima facie* evidence from proof.

While the above argues a role for *prima facie* evidence, and above mentioned legislations appreciate the applicant's difficulty to prove discrimination, there has nonetheless much criticism of the staged approach. It is understandable why Judge Landman, in setting South African precedent decided to discard the shifting burden (Landman, 2000).

Due to the pervasive use of statistical proof in Title VI cases, many American courts have also questioned this approach as Judge Higgenbotham did, in *Vyanich versus Republic National Bank* (1981): "... in a complex class action, utilising statistical proof and counterproof, the value of the

Burdine sequence – to highlight the issues of contest – is about as relevant as a minuet is to a thermonuclear battle” (cited in Norris, 1987, p. 68).

The above commentary refers to cases where litigants both prepare statistical evidence to discharge their first burden, and allow the statisticians to duel out the remainder of the case. The role of the *prima facie* case becomes clouded, and the mould of the shifting burden is redundant.

In cases where both parties present statistical evidence, as in the above-mentioned American case of *Vyanich versus Republic National Bank* (1981), the three-staged approach is clearly not relevant. However, this does present an interesting question as to the role of *prima facie* evidence under this contingency. Without the shifting burden, much potential power is placed in the hands of the applicant, benefiting from *prima facie* assistance, while able to launch a full-blown attack on the defendant. In cases where statistical evidence is presented by both parties, the judge would require a process by which to systematically evaluate evidence from both parties. While, the shifting burden certainly is not wholly appropriate, the underlying principles of the burden of proof remain indispensable: Firstly, the applicant must first raise reasonable inference of discrimination, with information available before a defendant is required to present defense (Landman, 2000). Secondly, the final burden, in any event, lies on the applicant to show the employer’s contravention (Skeen, 1997). While the staged approach might assist the judge in evaluation of the evidence, the judge does not require arguments to be sectioned and structured in the particular manner offered by the staged approach.

2.4.4 Option to Show Motive

The second reason given by Landman (2000) to abandon the shifting burden highlights the other important modification to American precedent: the removal of the need to show intent. During this case, much debate ensued on whether the applicant is required to show discriminatory motive. Landman (2000) concluded that the definition of unfair labour practices is indeed based on outcome, concerned with impact and not motive, intention or negligence. The court held that it is not necessary to prove intention of motive of the employer to discriminate, but conceded that it may be relevant to the remedy imposed. While a case will certainly be aided by evidence of motive and no reason exists having the courts disregard such evidence, the South African applicant need only raise inference of the different effect.

It is worthwhile noting that should American Federation of State, County and Municipal Employees (AFSCME) versus the State of Washington, (1985) have been presented to Judge Landman, the result may have well been otherwise, as the applicant would not have needed to show intent. It would be reasonable to conclude that the court would have found in favour of the applicant as per Section 27 of the Employment Equity Act (Republic of South Africa, 1998). This heralds great hopes for the merits of comparable worth in litigation in South Africa.

The above contingencies suggest that the burden should be appropriated according to the type of case put before the court. Should the type of evidence determine the nature of the burden, it begs the human resource profession as to the type of evidence, which may play a role in vindication of a compensation system.

2.4.5 Evidence in Compensation Discrimination Litigation

In Louw versus Golden Arrow Bus Services (2000), the applicant failed to establish a *prima facie* case of compensation discrimination. Judge Landman ruled in the favour of defendant and an appeal was dismissed (Hlophe, 2001). There is implicit controversy as to what level of type of evidence is required to establish a *prima facie* case in the compensation context

The American Civil Rights legislation, under the Bennett Amendment, sought to pave the way for employment discrimination litigation; establishing two doctrines (or evidentiary presumptions) under which a plaintiff can allege discrimination. Applicants under South African law, according to Dupper (2002), can also utilise these two evidentiary presumptions. These are disparate treatment and disparate impact and refer to the allegation of direct and indirect discrimination respectively.

2.4.5.1 Disparate Treatment

The disparate treatment presumption allows the applicant, to contend direct wage discrimination. The claim suggests that group membership as a prohibited ground, while irrelevant to successful performance or inherent business requirement, forms the basis of managerial decision. In the United States, disparate treatment is based upon the intention to discriminate, but may also be inferred from circumstantial evidence (Norris, 1987), a concession given due to the low probability of management to bluntly advertise their intention to unfairly discriminate.

According to Anonymous (1996), disparate treatment can be established *via* one of the following approaches:

- The Direct route: The applicant can follow the direct route proving the existence of fact without inference of presumption. The proof is usually of a “smoking gun” variety or direct proof of intentional discrimination as was the case in *International Union of Electrical Workers versus Westinghouse* (1980). This brand of proof is rare, as employers know that they are liable for statements of prejudice and overt actions of discrimination. Unfortunately, to date, it is still unclear what evidence will be required to meet the burden of proof, save for a “smoking gun” type evidence, having the employer frankly paying a lower compensation to certain jobs because as women occupy the jobs (England, 1992). The applicant’s difficulty in proving discrimination may be linked to the lack of “smoking gun” or direct evidence such as a tape recording or a slanderous letter. Organisations will rarely advertise discrimination. Plaintiffs generally rely on circumstantial evidence, but usually opt for the disparate impact approach out of lack of direct or circumstantial evidence (Rutherglen, 1986; England, 1992).
- The Indirect or Pretext route: As mentioned above, once the employer has articulated a business necessity reasoning, the applicant is able to show that the reason given by the employer is a pre-text for underlying discriminatory motive. To this regard, the applicant can use testimony and circumstantial evidence.

The terminology of direct and indirect evidence has caused much confusion, as the type of evidence employed by both parties, has bearing on the judgment, according to which route the applicant takes. According to Anonymous (1996, p. 1585):

...the flexible approach... rather than rigidly labeling direct or indirect as a *per se* categorization rule for determining on which track to place a case, judges should examine the probative value of proffered evidence and make a contextual decision based on its perceived quality.

Subjective evidence (testimony) showing intent in conjunction with statistical evidence in cases, not involving comparable worth issues has been sufficient to shift the burden, as was the case in *Bazemore versus Friday* (1986). In some cases, statistics alone have met the burden of proof as in *International Brotherhood of Teamsters versus U.S.* (1977); *Craik versus Minnesota State University Board* (1984); *Hazelwood School District versus United States* (1977) and *Segar versus Smith*, (1984), (England, 1992).

In the seminal American case of *Gunther versus County of Washington* (1981), the court allowed applicants to produce a claim of discrimination between different jobs, should the applicant be able to show intentional discrimination. That is, in order to show disparate treatment, the applicant must show that the reason for the differential was intentional discrimination. It unknown whether the removal of need to show motive in South African litigation may affect the inception of comparable worth.

The second evidentiary presumption is the more elaborate of the two, in which plaintiffs attempt to prove indirect discrimination.

2.4.5.2 Disparate Impact

The disparate impact theory was first enacted in the American case of *Griggs versus Duke Power Company* (1971). Here the Supreme Court found the applicant need not show the employer's intention to discriminate. According to *Anonymous* (1996), most cases follow this theory, due to the rarity of evidence required to show disparate treatment. The disparate impact presumption allows an applicant to establish indirect wage discrimination from evidence showing that an employer's policy, or application of a measuring instrument has a disproportionately negative effect on a protected group. *Dupper* (2000) described disparate impact as a statistical concept. The plaintiff usually establishes a *prima facie* case with statistical evidence.

Following suit of *McDonnell Douglas versus Green* (1973) the *prima facie* case although flexible to the case at hand must show that adverse impact occurred and that the explanation is not applicable (*Anonymous*, 1996).

Judge Landman in the South African, *Louw versus Golden Arrow Bus Services* (2000), referred to the South African case of *Kaidaka versus Amalgamated Beverage Industries* (1999), and *Bourne and Whitemore* (cited in Landman, 1999, p. 381), suggesting four tests for determining indirect discrimination. These were:

- Has the requirement of condition been applied equally to both sexes or all racial groups?
- Is that requirement or condition one with which a considerable small number of women (or men) or persons of the racial group in question can comply than those of the opposite sex or persons not of that racial group?
- Is the requirement or condition justifiable irrespective of sex, colour, race, nationality, ethnic or national origins of the person in question?

- Has the imposition of the requirement or condition operated to the detriment of a person who could not comply with it?

In the American case, *Wards Cove Packing Company versus Antonio* (1989), the burden of proof on the defendants was relieved slightly by no longer requiring defendants to prove that the intervention is business related. Defendants were only required to convey the business reason; as a result, the only way an applicant could succeed is by proving that the intervention is not business related. This precedent was partially relinquished two years later by the Civil Rights Act (United States Congress, 1991), which required, as per the setting of the *Griggs versus Duke Power Company* (1971) the employer to show that the practices are job-related and consistent with the needs of the business (England, 1992).

Should the courts accept a *prima facie* case, England (1992) pondered the likely evidence required to rebut such a case. Should the courts decide that *Wards Cove* decision applies to compensation, the employer would only have to explicate the business reason for the policy in question. Extending the issue to include disparate impact under comparable worth, England (1992) questioned whether the market wage would suffice. The cases in which the court has considered the case discrimination *via* market wages only concerned disparate treatment. It is unclear whether the courts would consider the subject under disparate impact. It is highly unlikely that the legislators intend to interfere with market forces (Blumrosen, 1979), but in the spirit of Title VII, (and of South African legislation,) definitely suggests that such a case could be considered.

The court in *Spaulding versus University of Washington* (1984) stated that it is doubtful whether disparate impact theory was intended to apply to market wage policy. The court in this case held that employers are merely price-takers (England, 1992). American Circuit courts have yet to clarify what type or standard of evidence in Comparable Worth Cases (involving Disparate Impact). According to England (1992), *dicta* from the Supreme Courts ruling in the *Gunther* case could be interpreted as disparate impact analysis, showing discrimination under comparable worth is not applicable under Title VII. A case of disparate impact under comparable worth has neither been allowed nor disallowed in either Circuit Courts or the Supreme Court.

Rutherglen (1986, p. 38) claimed that, “the courts have left the conceptual foundations of class claims of disparate impact and disparate treatment largely unexamined.” As Dupper (2002) did point out, the distinction between disparate treatment and disparate impact is accepted by South African courts,

however this distinction must now be examined, as the above American doctrines and judgments however no longer have the same meaning to South Africa, since *Louw versus Golden Arrow Bus Corporation* (Landman, 2000) albeit in the compensation context.

2.4.6 Clarification of the Burden of Proof

Defendants will easily carry the burden of production (under direct discrimination), leaving the case to be resolved on issue of pretext (whether the reasons offered by the defendant conceal intentional discrimination). The court decides whether the defendant took group membership in account. As was found in *McDonnell Douglas Corporation versus Green* (1973), the court realises that the most likely way of dealing with the question of group membership is involved in determining compensation, resides in statistical evidence. Statistical evidence could show discriminatory effects or that the reason submitted has not been applied evenly. The role statistics plays is unchanged in the absence of the shifting burden (Rutherglen, 1986).

Evidence of class claims of disparate treatment usually takes the form of class-wide statistics, supplemented with circumstantial evidence of disparate treatment. As was in the case of *Washington versus Davis* (1976), this form of discrimination is part of the organisational decision making process, and cannot be linked to instances attesting to intention. Individual claims of disparate impact are possible but largely inappropriate as it involves a claim of disparate impact against a particular group of employees and must be shown with class-wide statistics (Rutherglen, 1986). It can therefore be argued that as disparate impact, by definition, involves statistical evidence, and disparate treatment, involves statistical evidence in the pre-text stage, both differ little in approach. Furthermore, the statistical analyses attempt to establish the same, differing only in which stage statistical analysis is required and whether the plaintiff can prove intention.

Due to the lack of direct evidence:

...in practice direct discrimination cases, applicants in which no direct evidence is available present the most difficult hurdle for applicants to clear. In the majority of discrimination cases, applicants have to rely on inferences drawn from circumstantial evidence in order to establish a successful (unfair) discrimination claim. The availability and quality of evidence thus becomes of crucial importance. What remains clear is that in absence of clear-cut evidence, direct discrimination remains extremely difficult to prove (Dupper, 2000, p. 1144)

Judge Landman's (2000) ruling that intent is not required in proof of discrimination removes much of the distinction between disparate treatment and disparate impact. Applicants need not choose to attest disparate impact, on the grounds that no direct evidence is available. As the emphasis is on the effect of illegal discrimination on compensation level, it is largely immaterial what presumption is followed and how the defendant may rebut a *prima facie* case. It is ventured that, in this effect-driven evaluation, the distinction between presumptions, is only relevant in how the evidence is evaluated (what the applicant is attempting to prove). In light of the above, there is little value making a distinction between the two doctrines of discrimination in the compensation context.

Again, the Promotion of Equality and Prevention of Unfair discrimination Act (Republic of South Africa, 2000) prescribes that the evaluation of fairness is based on outcome. Statistical evidence fits well into this requirement, as it is:

- based on *de facto* fairness, devoid of employee perception;
- does not seek to prove intent or motive, and is based the effect of discrimination;
- able to investigate the employment process in search of possible illegal discrimination;
- not especially concerned with the distinction between disparate treatment and impact but based solely on effect of discrimination, and therefore can be used to rebut a *prima facie* case of either evidentiary presumption, (and is available for use by the applicant).

2.4.7 Clarification of the Evidence Required To Meet the Burden

Given, the above similarity between the requirements of both doctrines of discrimination, a new stance on the type of evidence which should meet the burden of proof is required in South African courts in order to contest, what could ostensibly be termed "disparate effect."

2.4.7.1 The Applicant's Evidence

Should the analogy between selection and compensation discrimination hold true, a *prima facie* case could be established with evidence showing that jobs of equal or perhaps commensurate worth, are paid different compensation, a disparity which could be linked to group membership. Although it is irrelevant from a compensation discrimination perspective that, on average, one population subgroup

earns more than another in the organisation³, (Conway & Roberts, 1984), it is likely that showing this disparity in a particular job grade would convince the judge that something may be awry. This would apply to both individual and class based claims, however the latter probably would constitute a stronger case. In selection, an 80% difference in selection rate referred to the 4/5ths rule is regarded as evidence of adverse impact (Arvey & Faley, 1988). It is unknown what the court would see view as a sizable disparity worthy of investigation. This makes the class based claim carry more weight, as only a small disparity might raise inference of unfairness. In an individual claim, this would be difficult as two individuals in the same job grade could differ enormously in outcome, due to variables such as performance appraisal scores and tenure. This difficulty in raising this presumption is the very rationale for the application of the *prima facie* evidence, but it is questionable whether the courts would entertain litigation on minor discrepancies due to the cost involved to the state (all things considered, a small differential could fail to raise the inference of unfair discrimination). This issue is discussed as introduction to in next following section.

In compensation discrimination cases, plaintiffs commonly have used regression analysis to show systematic illegal discrimination (Barrett & Sansonetti, 1986; Conway & Roberts, 1986). In any event, should the staged approach be applied, evidence such as this would be required, as mentioned above, to establish pre-text the applicant must prove that the defendant is guilty of discrimination as a pattern or practice (Dupper, 2002; Landman, 2002; Norris, 1987).

2.4.7.2 The Defendant's Evidence

In an individual claim, Landman (2000) did not find the mere production of reasons to be acceptable, and therefore the defendant is required to argue or submit evidence to the fact that the disparity is business related. Should a group of employees establish a *prima facie* evidence alleging widespread discrimination (class based), it is not an isolated incident but the compensation system itself, which requires vindication. Statistical evidence would be required to shift the burden.

In summary, both litigants should ultimately, although there would be exceptions where the judge is content that the applicant has shown discrimination at face value, be required to produce statistical evidence to support their case regardless of which type of discrimination is alleged. An irony emerges:

³ The fact that on average one population subgroup earns more than another in the organisation would, however, be highly relevant from the perspective of compensation-directed affirmative action initiatives aimed at eradicating the wage gap.

As the argument for the applicant to use statistical evidence is due to the pre-text stage, should there indeed be a challenge to the reasons forwarded by the employer, the pre-text stage is inevitable (as the applicant would contest the employer's reason and be unmotivated to seek litigation.) Moreover, in the case of compensation litigation, the same type of statistical evidence could be relevant to both plaintiff and defendant. Where both litigants present the same type of statistical evidence, the staged approach has little value and as such remain discarded as a procedure. The shifting burden requirements of the Promotion of Equality and Prevention of Unfair discrimination Act (Republic of South Africa, 2000) should nonetheless not be ignored, but guide the judge in decision making as per the original purpose of the staged approach as argued by Rutherglen (1886) and Hay (in Landman, 2002). If, however, less sophisticated statistical evidence could be sufficient to carry the burden for the applicant, (although again whether this would be the case is uncertain) the shifting burden model as a procedure, could possibly be retained.

The appropriateness of statistical analysis to the legislation, and the seminal judgments of Landman (2000) forebode the growing use of such methods in compensation discrimination litigation in South Africa. Although South African currently lacks case law where statistical evidence has been entered into litigation in the employment context, it is appropriate to look for the solution elsewhere. The next section reviews the use of regression analysis in compensation discrimination litigation as used abroad.

2.5 STATISTICAL EVIDENCE

"When you have eliminated the impossible, whatever remains, however improbably, must be the truth"

Sir Arthur Conan Doyle

An analysis over many individuals is required in which the litigants shows the court how these measurements of worth are applied (fairly or unfairly) across the organisation. Should the defendant be in the fortunate position to identify these factors and be able to demonstrate their effect in the compensation system with perfect certitude across every employee, the burden may well be carried. Unfortunately, grey areas do arise where one of the parties lacks accuracy (or conviction in argument), which upon dispute; the court is asked to arbitrate. Emphasis is placed on unexplained systematic differentials arising due to the application of the compensation system. The plaintiff would contend that these systematic differences are illegal because they can be accredited to group membership, while the defendant would either attest that the differentials shown in the *prima facie* case do not exist, may be attributed to chance, or that any systematic differences in outcome exist as acceptable requirements of the business.

Statistical procedures are able to account for the manner in which the system assigns treatments, defuse disorder and provide insight, if only to make a suggestion, with a level of likelihood to the truth. To this end, statistical evidence has been used in many fields of legal and social concern, involving among others, alleged discrimination in criminal prosecutions, educational opportunities, jury selection, sentence hearings and employment discrimination. The application of statistical proof is now commonplace in selection discrimination (Kaye, 1982).

Following the admittance of statistical evidence by the American courts in employment discrimination cases, academia has responded accordingly, researching the use of these procedures and soon ventured into suggestions as how to investigate compensation discrimination (Kaye, 1982; Loucopoulos, Pavur & Gutierrez 2002). The first of which was a note published in the Harvard Law Review (Note, 1975), which reviewed litigation and proposed possible statistical applications drawing on preceding case law and fictitious scenarios, imploring the use of statistics in cases such as compensation discrimination.

In adopting the premises required by proof through statistical inference, the [American] courts have taken a step necessary to the vindication of the legislative intent to eradicate racial, sexual, religious and alienage discrimination (Note, 1975, p. 387).

The Note (1975) approached the topic very simplistically and was particularly naïve to the implications and shortcomings of proposals. The following basic litigation scenarios were outlined, for which specific applications were recommended:

- For use by the plaintiff:
 - The demonstration of differential weightings: Statistical analysis reveals disparate impact as differentiation based upon illegal bias in the application of the criterion. Regression analysis can uncover statistically significant group differences in numerical weightings based upon the standard deviation of each estimated weighting.
 - Estimation of a relationship between compensable factors and compensation out of chaos: In a case where the applicant suspects adverse impact, but no measures of worth are available, statistics could be used to explore the probability that certain explanatory variables were used in the actual wage determination. Reference was made to the selection case of Douglas versus Hampton (1975), in which the results of a general knowledge and aptitude test were unavailable. In the compensation context, the plaintiff would be able to include measures which could be expected to influence compensation, and apply a univariate model to test the hypothesis of discrimination

including job related measures could be expected to influence the decision. In addition, this method does not limited to cases where the employer merely explicates a set of factors, as the analysis is able to penetrate the reasons behind the decision. In South Africa, the applicant need not explicate any factors, but need only allude to adverse impact.

- For use by the defendant:
 - Rebuttal of a *prima facie* case: An employer differentiating between employees with a non mechanical formula placing employees into various job grades, based on attendance records, productivity, seniority and a subjective appraisal, may use statistical analysis to uncover the nature of the relationship between the factors taken into consideration and the decision, with the weightings on each explanatory factor. By use of regression analysis, the court would be able to establish whether any subjective evaluations, which explain wage disparities, are linked to group membership. The employer may rebut the *prima facie* evidence by showing neutral explanatory factors, which fully account for the disparity, *via* an analysis of variance (ANOVA). (This however is not satisfactory as real group related differences might exist with regards to that being subjectively evaluated – the question is whether group membership explains variance in pay once legitimate determinants have been controlled for). A *prima facie* case, which is based on percentages purports an unusual event coupled with the opportunity to discriminate, may be annulled by statistical evidence showing that compensation system is fair. Unfortunately, as discussed later in this chapter, statistical analysis can be used to sort out “consistent patterns from a vast array of opportunities, qualifications and biases which may leave an employer ample room to justify any employment decision” (Note, 1975, p. 406). Therefore, due to its fortuitous construction this approach is arguably incredible and unlikely to shift the burden.
 - Demonstration of the unimportance of a discretionary step alleged as discrimination: Should *prima facie* evidence hold, showing that a procedure results in disparate impact, the defendant might be unable to avoid prosecution. However, the defendant unable to challenge the fact directly, could prove that the job related explanatory factors which potentially accounted for the disparate outcome, while regrettably being significant, has a negligible effect on the compensation outcome, thereby avoid harsh repercussion (back pay).

The Note (1975) in the original proposal outlined the following limitations:

- Courts may be hesitant to become involved with complicated statistical analysis.
- The limitations of the data available place limitations on the analysis, which may be applied.

Since the Note (1975) was published, both plaintiffs and defendants in American cases have produced regression analysis as evidence in Title VII cases, most of which have been plagued by the two above-mentioned limitations. Research followed accordingly, fuelled by the related comparable worth debate. Thought on the matter developed into an ardently debated field of statistics. As could have been anticipated, economists have even argued that statistical evidence holds more value than other forms of evidence.

To most economists the insistence on finding “smoking gun” evidence of discriminatory actions, intent or motivation seems quite irrelevant to determining whether market discrimination exists. In crude terms, for economists evidence of discrimination merely requires the presence of unexplained differences in compensation or employment. In practice, the economists view has made considerable headway in the courts (Ashenfelter & Oaxaca, 1987, p. 322).

Simple statistics are often quoted to bolster arguments in many forms of litigation. The most straightforward range from the descriptive to correlations between variables. In the compensation context, fairness requires differentiation associated with compensation to be based on reasonable, acceptable forms of discrimination. Legitimate determinants of pay could be related to/correlated with group membership. It is therefore not enough to enter proof of discrepancy in mean salaries between groups, or significant correlations between group membership and compensation.

The judge presiding in *Vuyanich versus Republic National Bank* (1980) stated:

... a simpler comparison of all average wage of all white employees and all black employees will not be enough to prove salary discrimination... ...we reject the use of raw average pay differentials as the basis for a *prima facie* case where the pay is averaged across a wide range of jobs and backgrounds (cited in Conway & Roberts, 1986, p. 110).

Kaye (1982, p. 781) added to this line of thought stating that “...proof that the selection criteria impact[s] more drastically on a protected class does not strictly imply that their use constitutes discrimination, at least where these criteria are reasonably related to the plaintiffs’ application.” In the selection context, the 80% rule constitutes *prima facie* evidence of discrimination. In the selection context, the selection ratio is calculated for a particular job. This selection ratio could be interpreted as the mean of a dichotomised (0, 1) expected criterion scale. Finally, what is being evaluated in the selection context is the consequence of a specific selection decision-rule assigning applicants to either a reject or accept treatment based on expected criterion performance. In the case of compensation, a decision-rule in terms of which employees are assigned to compensation treatments needs to be

evaluated by comparing the mean compensation allocated to members of protected and non-protected groups in a fixed job grade. *Prima facie* unfair discrimination would therefore be indicated if the ratio of the mean compensation paid to members of the protected group to the mean compensation paid to members of the non-protected group in jobs of the same job grade, were less than 80%. This, moreover, begs the question what proportion of these ratios should fall below the critical 80% benchmark. However, as mentioned previously, it is unclear whether this rule would apply well to the compensation context. Although a measurement of worth results in a relative disadvantage to a certain class, it is not necessarily grounds for a *prima facie* case. It is uncertain whether such a rule may be appropriate in the compensation context.

Between-group means of compensation distributions, given a fixed job grade, could coincide even when differences in compensation would be based on illegitimate factors or could differ when differences in compensation would be based solely on legitimate business related factors. Since compensation level is not an objective criterion, it would be more correct to argue that between-group means in job worth could differ given an equal compensation distribution. The between group means approach is nevertheless not a definite means to assist in diagnosing unfairness. The plaintiff's evidence only serves the purpose of raising doubt whether differences in mean pay reflect *bona fide* differences in legitimate pay determining factors. Moreover, as is the case in selection litigation, the foregoing suggests that it is possible that under specific conditions unfair discrimination in compensation can exist even though no *prima facie* evidence of the discrimination would be available in terms of the 80% rule.

A method is therefore required to siphon out legitimate reasons for relative disadvantage from those, which do so unnecessarily. In *Bazemore versus Friday* (1986), the American Supreme court formally accepted the use of regression analyses in compensation discrimination cases and it has since been used to various degrees of merit in countless of compensation discrimination cases. For the sake of brevity, all court cases referred to in the following section refer to American case law.

2.5.1 The Appropriateness of Regression Analysis

The American courts have been cautious to employ a statistical definition of discrimination since the models are only approximations of employer behaviour (Conway and Roberts 1984). It has been argued that the operational definition of fairness, which the court accepts as *prima facie* evidence, is the definition which holds until the defendant rebuts it in offering a different operational definition,

which the court may choose to accept or disfavour for the previous (Conway & Roberts, 1983). This would hold true in the case where the applicant's view on what comprises an appropriate operational definition of fairness, differs from the defendant.

Within the broad guidelines of its decision... the court has left the probative force of statistical evidence to be established... this depends not only on the accuracy of empirical data available and the validity of statistical methods used, but also on the soundness of the economic model presupposed by the statistical method and the relevance of that model to the claims before the court. A corollary to the Court's refusal to impose hard-and-fast requirements upon statistical proof is its refusal to specify the elements of a plaintiff's *prima facie* case in class claims of disparate treatment. (Rutherglen, 1886, p. 53).

While this does give the human resource profession and academia the freedom to explore better methods of evidence, the courts have failed to tender a formal operational definition of fairness.

The operational definition offered to the parties through regression analysis, is a logical starting point as the approach suits the intention of equity legislation. In order for those evaluating statistical information to arrive at a decision on whether the parties have carried the burden of proof, it would be desirable to form an idea of how compensation fairness would appear in a statistical model, so that comparisons may be made.

Chapter one of the Promotion of Equality and Prevention of Unfair Discrimination Act (Republic of South Africa, 2000), refers to equality as outcome based. While, the merits of the job evaluation system certainly forms the basis of evidence leading to the justification of the compensation system, evidence concerning the valid, reliable and unbiased measurements of worth in and by itself fails to show that the outcome is fair. The demonstration of fairness therefore requires further evidence to show that the manner in which the measures of worth are used, does not differentially treat individuals on the basis of group membership. The following section elaborates on fairness within the compensation context, as per the description given by Poolman, (1985) where fairness also refers to the legal conviction of society.

Regression is able to adjust for differences in valid reasons for discrimination therefore enabling the researcher to determine whether group membership explains unique variance in compensation not explained by legitimate determinants (Harris & Suszko, 2004). In doing so, the effects of differential overall performance worth are separated from that of unlawful discrimination. Equal treatment implies that as overall performance worth increases, individuals of different groups remain on par in terms of

compensation. The intentions of the law deem regression analysis as the most suitable technique to deal with issues of discrimination. Multiple regression analysis, according to Norris (1987, p. 63), has been “found to be a strong theoretical approach to the review of cases...consistent with the analytical structure established under Title VII.” Fisher (1980, p. 705) described a distinctive characteristic of multiple regression analysis as “able to provide information about the effects of the variable of interest on the dependent variable without necessarily being able to predict the dependent variable itself with great accuracy.”

Fisher (1980) holds multiple regression analysis to be highly suited to the analysis of wage discrimination cases, arguing that used correctly, it is relatively simple. Although some do not share this opinion (Barret *et al.*, 1986), compared to its alternatives such as urn models proposed by Levin and Robbins (1983) it is within the intellectual grasp of most human resource professionals. Fisher (1980, p. 725) also praised “the readiness with which it can be cast into the mould of a test of significance of a particular regression coefficient.” As such, Norris (1987) stated, “the application of multiple regression analysis offers great and, perhaps, the only potential for addressing certain types of Title VII claims” (p. 63). Harris and Suszko (2004, p. 59) cited the appellate court in *Babara Lavin-Mceleney versus Marist College* (1999), who recently upheld an appeal concluding, “Regression analysis provided a scientifically valid method for identifying discrimination.”

The correlation between worth variables, related to the needs of the business, and compensation, through its logic, has made for compelling arguments. Barrett and Sansonetti (1986) reviewed 29 cases of compensation discrimination litigation, where sexual and racial discrimination were alleged. Although their review is rather dated, it nonetheless shows a relationship between the defendant’s tendency to use regression analysis to rebut *prima facie* cases and the outcome of the litigation.

Given the above, the model proposed for use in compensation fairness, is a lateral extension of the regression model of Cleary (1968). Although, fairness models such as the equal risk, constant ratio and conditional probability model have been proposed in the selection context (Arvey & Faley 1988; Cascio, 1998; Kaplan & Saccuzzo, 2001), regression analysis however, is the most appropriate for use in compensation context. This model is the most widely used model within the selection context (Arvey & Faley, 1988; Peterson & Novick, 1976). While Cleary (1986) is not explicitly mentioned in the compensation literature or litigation, a regression approach during compensation fairness litigation is generally accepted in academic and management circles (Fisher, 1980; Harris & Suszko, 2004; Norris; 1987), as the most appropriate and practical alternative, befitting the legislation. Regression

analysis combines well with the use of worth variables and pay curves, and therefore can fruitfully model the actual compensation process.

Table 3: Number of Cases Won by the Defendant and Plaintiff when Regression Analysis was presented (Barrett & Sansonetti, 1986, p. 506).

Condition	Won	
	Defendant	Plaintiff
Defendant and plaintiff presented regression analysis	10	6
Defendant presented other statistics and plaintiff presented regression analysis	5	3
Defendant presented no statistics and plaintiff presented regression analysis	1	1
Defendant presented regression analysis and plaintiff presented some other statistics	2	1

2.5.2 Adaptation of Cleary's Regression Model of Selection Fairness to Compensation Fairness

Regression analysis, traditionally used to build statistical model of prediction, using independent or predictor variables to estimate dependent or response variables, may be applied in this context as an assessment technique. In this sense, the researcher wishes to evaluate the independent variables' ability to explain variance in the dependent variable. In the case of compensation discrimination the dependent/criterion variables are measurements of overall performance worth and the independent variable is compensation level. Measurements of overall performance worth should be the only factors that determine the compensation level. Although practically compensation level is being regressed on the various measures of overall performance worth, conceptually the researcher actually dons the reverse perspective, that being, evaluating the level of compensation that has been awarded in terms of measures of worth as the criterion.

In order to illustrate regression in sufficient detail, the following explanation assumes that due to time, financial or similar constraints, a sample group of a larger organisation is taken as is typical of the case law involving large American public organisations. Should accurate and usable data be available on the entire staff complement, (that is, the population), the following explanation of concepts would be

explained by means of population parameters. The latter would be more desirable being worthier evidence to shift the burden of proof, as it would encapsulate the entire process, rather than a selected portion of the organisation being used to surmise the total. In keeping with this, a counter argument could not be launched by the opposition regarding the nature of the sample group or inferential statistics. Should the entire organisation be used, the context is slightly altered the purpose for inferential statistics and the null hypothesis would be negated. The regression analysis presented based on the entire staff compliment is a description (opposed to an approximation) of the actual employment process.

In a simple linear format, the basic regression model can be expressed as equation 1:

$$E[Y | X] = a + bX \text{ ----- 1}$$

where $E[Y | X]$ is the predicted value of Y and a is the value of $E[Y | X]$ when X is zero, while b represents the regression coefficient, that is, the slope of the regression line, as the change in compensation for change in the measurement of job worth. Here, X is representative of a measure of worth. When multiple regression analysis is used, (involving multiple predictors of compensation) a more in depth investigation could be put forth, indicating the nature of relationship between distinct measures of job worth and compensation level.

2.5.2.1 Operationalisation of Overall Performance Worth in the Regression Model

Unlike the case of selection fairness, there is no correlation to establish which/whether legitimate factors significantly explain unique variance in the criterion. It is therefore necessary to establish the permissibility of including specific factors that may legitimately affect compensation in a given situation in the regression model through logical argument rather than statistical evidence.

Fisher (1980) stressed the issue regarding the inclusion or exclusion of important variables, in the development of a model.

To proceed by first looking at the data and then including those factors that appear correlated with the dependent variable is a recipe for spurious results. It leads to a situation where no true test of the estimated relationship can be made... The measurement provided by the least squares regression is a way of making theoretical assumptions precise or of testing them; it is not a substitute for thought (Fisher, 1980, p. 714).

Computer packages often employ step-wise regression as a method of estimating the effects of variables. The computer would systematically include that variable most correlated to the independent

variable, and then search for the second, which correlated with the associated error score and so forth. In this way variables, which belong in the relationship, but used later in the method, may be excluded (Fisher, 1980; Howell, 1999). Fisher (1980, p. 715), also warned of the following:

If one tries enough combinations, then in a particular sample, one will tend to get some relationship that appears to fit well. Therefore, a properly done study begins with a decent theoretical idea of what variables are likely to be important. It can then proceed to test well-defined hypotheses about additional variables. But a study that casts about for a good-looking relationship by trying all sorts of possibilities is very likely to come up with relationships where none exist.

This is echoed by Levine, Berenson and Stephan (1997, p. 587) who held unethical behaviour as:

- Forecasting a response variable of interest with the wilful intent of excluding certain variables from consideration in the model.
- The deletion of observations from the model to obtain a better model without giving reasons for deleting these observations.
- Making forecasts without providing an evaluation of the assumptions when he or she knows that the assumptions of the least squares regression have been violated.

Rather, Fisher (1980) advocated placing all the variables in simultaneously as a slightly better method as it is often more fruitful to begin with a bigger model and work towards a simpler one. It would be better to proceed as described below where the research fits a model with all the legitimate determinants of compensation level in the model and then delete those from the model that do not significantly explain unique variance in pay not explained by the other effects in the model.

A regression analysis in which compensation is the dependent variable and job worth (the job evaluation score) and its related variables are independent, may assist the researcher to develop and fit the regression model expressed as equation 2.

$$E[Y | X] = \alpha + \beta_1[X_g] + \beta_2[X_p] + \beta_3[X_t] + \beta_4[X_g * X_p] + \beta_5[X_g * X_t] + \beta_6[X_p * X_t] \text{ -----}2$$

In this illustrative, arbitrary example, X_g represents a job evaluation score, X_p a performance appraisal, X_t a measure of tenure, that is, the number of years in the organisation. The data set would consist of individual employee records, (possibly from a human resource audit). The observations in the dataset are individuals. (Although a case could be made for using jobs as observations depending on the nature of the allegation.)

The foregoing regression model could be expanded through the inclusion of one or more interaction terms. The researcher could present $[X_g * X_p]$ as a difference in compensation based upon premium or unsatisfactory performance at a particular job grade. The effect of change in performance would increase with job grade. $[X_g * X_t]$ suggests a difference in compensation based upon a job incumbent's tenure at a particular grade due to a higher annual raise allocated to higher job grades to retain scarce skilled employees. $[X_p * X_t]$ similarly implies compensation differences due to job incumbents premium or unsatisfactory performance over the course of tenure.

Although, it is possible to derive a basket of reasons for a particular organisation, which may be submitted as justification for wage differences, it would not be prudent to suggest a comprehensive list for use in litigation. As each compensation practice is specific to the individual employment contract, industry and business, there are numerous factors, which an employer may take into account.

As Fisher (1980) suggested above, in order to develop the model, it may be useful to delete those explanatory variables, which play little or no part. The partial F -criterion isolates the contributions of each variable after all the other variables have been included into the model. As explicated by Levine *et al.*, (1997), the contribution of the variable X_k , given the influence of all other variables X_i included in the model, is reflected in the sum of squares due to the regression of Y on X_k controlling for all other predictors in the model shown as equation 3:

$$SSR(X_k | X_i) = SSR(\text{All } X \text{ including } X_k) - SSR(X_k) \text{ -----} 3$$

The hypothesis that X_k does not explain any unique variance in compensation not explained by the other predictor variables included in the regression model could be tested by testing the following null hypothesis:

$$H_0 : \beta_k = 0 \mid \beta_i \neq 0$$

$$H_a : \beta_k \neq 0 \mid \beta_i \neq 0$$

The partial regression coefficients tests the null hypothesis through the calculation of the F -criterion shown as equation 4:

$$F = \frac{SSR(X_k | \text{all } X_i \text{ except } k)}{MSE} \text{-----}4$$

Should the value obtained from equation 4 exceed the F -critical value, the decision would be to reject the null hypothesis and the variable would be retained. Similarly, it is possible measure the proportion of variance in compensation accounted for by particular explanatory variables while holding constant, the other explanatory variables (Levine *et al.*, 1997).

$$r_{Yk.i}^2 = \frac{SSR(X_k | X_i)}{SST - SSR(X_i \text{ and } X_k) + SSR(X_{k1} | X_i)} \text{-----}5$$

The F-criterion could be used unethically where a regression equation could be piecemealed together, to show a perfect vindicating model. Herein lies the importance of demonstrating the model's ability to portray the employment process (Fisher, 1980). Should enough modifications be made to the model, by way of revising quantification of measurement scales or trading variables, based on their statistical significance, it is possible to manufacture corroboration out of the given sample, rendering the exercise worthless. As discussed later, it is expected of the court to investigate the method by which models are developed, with particular attention to the extensive use of the above. Fisher also warned of how litigants may attempt to exaggerate or conceal illegal discrimination, through the choice and measurement of explanatory variables.

2.5.2.2 A Regression-based Interpretation of Compensation Fairness

Cleary (1968) held that criterion references inferences (in the selection context, this would be predicted job success), are unfair if group membership explains variance in the predictor either as a main effect or in interaction with the predictor, which is not explained by the predictor but which is ignored when deriving criterion inferences. Selection decisions are based on expected criterion performance estimates derived from measures of person-centered determinants of job performance. Cleary (1968) held that these criterion inferences are unfair if group membership (D) explains variance in the criterion (Y) either as a main effect or in interaction with the predictor (X), which is not explained by the predictor and which is ignored when deriving criterion inferences from the predictor. Unfairness would therefore result in the expected criterion performance of members of a specific group being systematically underestimated while the performance of members of another group is systematically overestimated. If group membership significantly explains unique variance in the criterion, it would

imply that the regression of the criterion on the predictor differ across groups. This is shown in Figure 3.

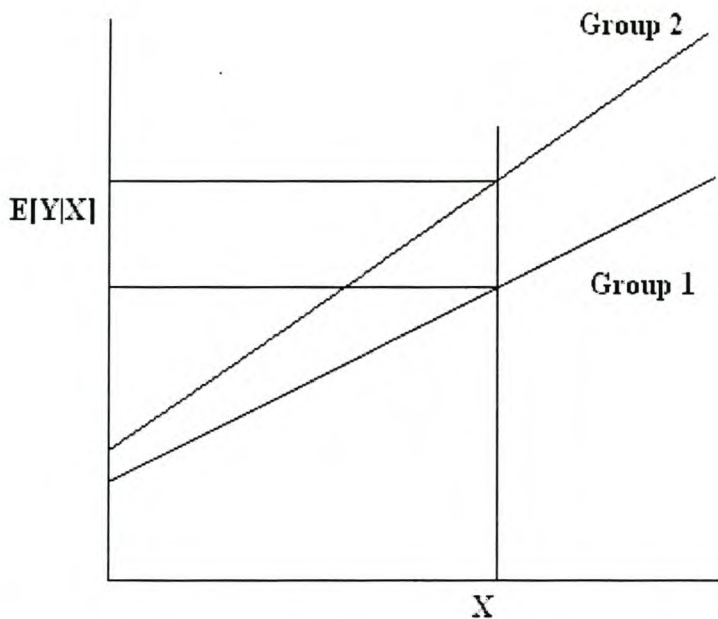


Figure 3: Unfairness as advocated by the Cleary Model.

Cleary (in Cascio, 1998, p. 123) established the following implications of ignoring the group effect in deriving criterion estimates from the predictor:

With this definition of bias, there may be a connotation of unfair, particularly if the use of the test produces a prediction that is too low. If the test is used for selection, members of a subgroup may be rejected when they were capable of adequate performance.

The uniform use of the predictor information across groups will be considered fair when D (the group variable) does not influence Y either as a main effect or in interaction with X . A common regression line may then be applied across subpopulations. This assures that predicted job performance will not be systematically under- or over predicted. That is to say that within-group regression lines do not differ in gradient or intercept (Peterson & Novick, 1976).

Likewise, it could be argued that the compensation system is unfair if variance in compensation is explained by group membership as a main effect or in interaction with the legitimate determinants of compensation, which is not explained by the legitimate determinants of compensation. When group membership explains variance in compensation, which is not explained by the legitimate determinants of compensation, members of a specific group will be systematically undercompensated while

members of another group will be systematically overcompensated. If group membership significantly explains unique variance in compensation, it would imply that the regression of compensation on the performance worth differs in terms of intercept across groups. If group membership in interaction with performance worth significantly explains unique variance in the criterion, it would imply that the regression of compensation on performance worth differs in terms of slope across groups.

There are, however, subtle but important differences between the two applications. In the model's original application in selection discrimination, X is treated as the predictor of job success, and Y , as a measure of actual job success. Job performance is estimated as an objective reality at the time of selection decision-making. Since job performance is an objective reality, it would be appropriate to ask to what extent the intermediate criterion Y is an accurate measure of the ultimate criterion job success (η). Moreover, it would be appropriate to ask to what extent an accurate estimate of Y was obtained *via* the regression model. In the compensation context, however, the dependent variable Y is compensation level, which does not exist as an objective reality independent of a specific compensation system but rather is determined/constituted by a constellation of determinants, a value derived from the labour market. In the compensation context X , however, is a measure of overall performance worth which does exist as an objective reality and is used to evaluate the appropriateness of the compensation levels awarded to specific individual in specific jobs rather than to estimate compensation levels. The independent and dependent variable are therefore exchanged, as in the compensation context Y is evaluated in terms of overall performance worth. Although overall performance worth is treated as if it were a predictor in the regression model, it therefore actually serves as the criterion. Should group membership influence this relation either as a main effect or by interaction with job worth variables, unfair discrimination is inferred.

Applying the logic of the Cleary fairness model (1968) to compensation discrimination could potentially result in an extremely cumbersome and unwieldy regression model due to the number of main and interaction effects that would have to be included in the fully saturated regression model. By following this approach the researcher: firstly, potentially sidesteps the issue of linearity, (discussed later); and secondly, is able to investigate which performance worth variables interact with group membership to influence compensation. This approach is found in the literature (Conway & Roberts, 1986; Finkelstein, 1980, Fisher, 1980; Norris, 1987). For reasons discussed above (the lack of an objective criterion), this procedure is vulnerable to dubious results. (The researcher begins with the saturated model, systematically removing variables to generate the model).

The fully saturated model could, however, be considerably simplified by forming a single composite performance worth variable. Factors which are legally allowed to affect compensation but which do not significantly explain unique variance in compensation are therefore first eliminated as independent effects from the initial regression model. The reduced model would then be refitted and a composite worth score would be output to the active data file. The weighted composite worth variable would subsequently be inserted into a new regression equation along with a group membership main effect and a moderation effect. That is, those effects that do significantly [$p < 0.05$] explain unique variance in worth, and recognised by the court as being legitimate variables (business related and used in the actual compensation system), are then entered as a weighted composite job worth score (based on their regression coefficients) as X_{comp} into a model along with D and $D * X_{comp}$. This is represented by equation 6.

$$E[Y | X_{comp}; D] = \alpha + \beta_1[X_{comp}] + \beta_2[D] + \beta_3[X_{comp} * D] \text{ -----6}$$

where $D = 0$ if case belongs to group one, π_1 and $D = 1$ if case belongs to group two, π_2 . The researcher can then proceed with testing whether group membership significantly accounts for any of the remaining variance in compensation once all the legitimate factors are controlled.

Attention, in both approaches to model development, must be given to an issue, which arose in *Wards Cove Packing Company versus Antonio* (1989). Litigants, especially the defendant, must provide supplementary evidence to confirm that the (effect) variables chosen for inclusion in the regression model reflect the actual compensation system. In South Africa, the burden of production is not as mechanical as portrayed above (Landman, 2000), as the litigant must show that the variables which are inserted into the analysis are reliable, valid, unbiased and actually play a role in the determination of income. The model may therefore not be contaminated by variables that did not actually influence the actual determination of compensation, nor may it exclude variables that actually did play a role in determining income. The regression model essentially attempts to model an actual compensation system, operating in complex labour market. Merely demonstrating that they submitted variables that significantly correlate [$p < 0.01$] with compensation is not sufficient evidence, should the litigant hope that judge may base summary judgment on the inference of the model. This is the central theme running throughout the remainder of this section.

2.5.2.3 A word on the Dummy Variable Approach

Traditionally, two regression analyses were performed in order to show dissimilar treatment between groups, which subsequently rendered an equation for each group. Should the tests for equality in slope and intercept, lead to the rejection of the accordant null hypotheses, it would be correct to conclude that the population models differed, but as Berenson, Levine and Goldstein (1983), pointed out, the reverse does not hold, as by nature of hypothesis testing, the researcher cannot accept the null hypothesis. Berenson *et al.*, (1983) also explained that should the null hypothesis be rejected, it would be impossible, by this method, to discern differences in slope and intercept. This is due to the following two reasons:

- Firstly, the test for identical slope is performed irrespective of intercept, and *visa versa*. It can therefore be contended that much room is left for coincidence and that neither test failed to reject the over arching null hypothesis.
- Secondly, the fact that the tests were performed separately affects the level of significance.

This problem is circumvented by the use of a single model, with a classification factor. The use of a dummy variable was suggested by the Note (1975) and portrayed in the above section. The categorical variable (referred to in this form of application as a dummy variable) may be factored into the equation. By adding a dummy variable, group membership is uniquely represented in the equation and parameters are estimated in conjunction with the dummy variable, that is, the slope associated with the variable, and interaction terms (Berenson *et al.*, 1983). The question may then be answered whether group membership significantly affects the effect of performance worth on compensation, that is, whether group membership is a moderating variable and/or whether group membership significantly affects compensation directly as a main effect.

When Barrett and Sansonetti (1988) reviewed cases in which both approaches have been used to good effect, the second method (the dummy variable approach) seems to be the most preferred. However, Barrett and Sansonette (1988) deemed this approach necessary when an insufficient number of individuals from one of the groups are represented in the sample. This seems a questionable argument, as both methods require a sufficient number of observations from each group to ensure stable regression parameter estimates.

2.5.2.4 Evaluating Compensation Fairness in terms of the Cleary Model of Fairness

Theron (2002) presented a number of steps in terms of which the fairness of a selection procedure could be tested in terms of the Cleary Model. This procedure could be adapted to the evaluation of the fairness of a compensation system as follows. Assume two groups π_1 (the protected group, $D = 0$) and π_2 (the non-protected group, $D = 0$). Assume a total sample size n so that $n_1 + n_2 = n$. Assume $\rho[X, Y] > 0$. SPSS output, based on fictitious data has been included to illustrate each step. The syntax of the full procedure and a description of the manner in which the data has been generated, are provided in the Addendum, where each step has been presented by way of example, for both fairness and unfairness.

Step 1

Regress compensation level Y on a weighted linear combination of performance worth variables (as a model of the actual employment process) X and calculate the residuals. Plot the residuals against the composite performance worth variable (X) with group as a plot symbol. Draw in a horizontal reference line through the Y-axis on zero. Inspect the residual plot for systematic group related differences in the distribution of residuals. Systematic group related differences in the distribution of residuals would indicate unfair discrimination in compensation with members of the group predominantly falling above the zero residual reference line being disadvantaged.

Step 2

Calculate the mean compensation residual associated with each group. Test the significance of the observed difference in mean residuals across groups π_1 and π_2 by means of a one-way analysis of variance. Significant differences in mean residuals would indicate unfair compensation but would not reveal the exact nature of the problem.

Step 3

Regress compensation level Y on a weighted linear combination of job worth variables X for each group separately. The subsequent statistical procedure outlined below, in terms of which coincidence of regression models are tested, is based on the assumption of equal error variances across groups. That is, performance worth measures explain variance in compensation level equally for both groups. The following null hypothesis is therefore tested:

$$H_{01} : \sigma^2[Y | X; \Pi_1] = \sigma^2[Y | X; \Pi_2]$$

$$H_{a1} : \sigma^2[Y | X; \Pi_1] \neq \sigma^2[Y | X; \Pi_2]$$

This is done by calculating the F ratio shown as equation 7 (assuming that $s^2[Y | X; \Pi_1] > s^2[Y | X; \Pi_2]$):

$$F = \frac{s^2[Y | X; \Pi_1]}{s^2[Y | X; \Pi_2]} \text{-----} 7$$

$$F \sim F[n_{1-2}; n_{2-2}]$$

Step 4

If the null hypothesis (H_{01}) cannot be rejected [$p > 0,05$], the full-saturated model shown as equation 8 is fitted on the data to test H_{02} .

$$E[Y | X] = \alpha + \beta_1[X] + \beta_2[D] + \beta_3[X * D] \text{-----} 8$$

$$H_{02} : \beta_2 = \beta_3 = 0 | \beta_1 \neq 0$$

$$H_{a2} : \beta_2 \neq \beta_3 \neq 0 | \beta_1 \neq 0$$

H_{02} is tested by calculating $F = \{(SSR[b_1, b_2, b_3] - SSR[b_1]) / [p - 1]\} / MSE[b_1, b_2, b_3]$

where $F \sim F[p - 1, n - p - 1]$ and p represents the number of effects in the saturated model (in this example, $p = 3$).

If H_{02} fails to be rejected, the saturated model is reduced to equation 9:

$$E[Y | X] = a + b_1[X] \text{-----} 9$$

This implies that the regression equation of groups π_1 and π_2 are equal in slope and intercept, and therefore that compensation is determined by a fair compensation system. If H_{02} is not rejected the procedure terminates.

This furthermore implies that differences in compensation exist that cannot be explained in terms of legitimate performance worth variables, are systematically related to group membership. The compensation system therefore to some degree unfairly discriminates against members of a specific

group. In this case, further steps are required investigate where significance differences occur. To determine whether the group membership*performance worth interaction term significantly explains variance in compensation in a model that already contains the performance worth and group membership main effects, H_{03} is tested.

$$H_{03} : \beta_3 = 0 \mid \beta_1 \neq 0; \beta_2 \neq 0$$

$$H_{a3} : \beta_3 \neq 0 \mid \beta_1 \neq 0; \beta_2 \neq 0$$

H_{03} is tested by calculating the F ratio expressed as equation 10.

$$F = \{(SSR[b_1, b_2, b_3] - SSR[b_1, b_2]) / [p - 2]\} / MSE[b_1, b_2, b_3] \text{-----} 10$$

where $F \sim F[p - 2, n - p - 1]$

If H_{03} fails to be rejected, it implies parallel regression lines for each subgroup which differ in intercept only. The interaction term is therefore removed from the saturated model, so that the model now can be expressed as equation 11:

$$E[Y \mid X] = a + b_1[X] + b_2[D] \text{-----} 11$$

Solving equation 11 for the dummy variable results in equation 11a and 11b: differing in terms of intercept only:

$$E[Y \mid X_{\Gamma 1}] = a + b_1[X] \text{-----} 11a$$

$$E[Y \mid X_{\Gamma 2}] = [a + b_2] + b_1[X] \text{-----} 11b$$

Step 6

Although it is not necessary, should H_{03} fail to be rejected the null hypothesis H_{04} could be tested to determine whether the group main effect significantly explains variance in compensation in a model that already contains the performance worth main effect but excludes the group membership*performance worth interaction effect:

$$H_{04} : \beta_2 = 0 \mid \beta_1 \neq 0; \beta_3 = 0$$

$$H_{a4} : \beta_2 \neq 0 \mid \beta_1 \neq 0; \beta_3 = 0$$

Should H_{03} be rejected the following null hypothesis is tested to determine whether the group main effect significantly explains variance in compensation in a model that already contains the performance worth main effect and the group membership*performance worth interaction effect, H_{05} is tested.:

$$H_{05} : \beta_2 = 0 \mid \beta_1 \neq 0; \beta_3 \neq 0$$

$$H_{a5} : \beta_2 \neq 0 \mid \beta_1 \neq 0; \beta_3 \neq 0$$

H_{05} is tested by calculating the F ratio expressed as equation 12:

$$F = \{(SSR[b_1, b_2, b_3] - SSR[b_1, b_3]) / [p - 2]\} / MSE[b_1, b_2, b_3] \text{ ----- 12}$$

where $F \sim F[p - 2, n - p - 1]$

If H_{05} fails to be rejected, the main group effect should be dropped from the saturated model. This implies that the two group regression lines share the same intercept but differ only in terms of slope as shown in equation 13.

$$E[Y \mid X] = a + b_1[X] + b_3[X * D] \text{ ----- 13}$$

Solving equation 13 for the dummy variable results in equation 13a and 13b differing in terms of slope only.

$$E[Y \mid X_{111}] = a + b_1[X] \text{ ----- 13a}$$

$$E[Y \mid X_{112}] = a + [b_1 + b_3][X] \text{ ----- 13b}$$

If H_{05} is rejected, the saturated model is retained, as the two group regression lines differ in terms of slope and intercept as shown in equation 14:

$$E[Y \mid X] = a + b_1[X] + b_2[D] + b_3[X * D] \text{ ----- 14}$$

Solving equation for the dummy variable results in equation 14a and 14b differing in terms of intercept and slope:

$$E[Y \mid X_{111}] = a + b_1[X] \text{ ----- 14a}$$

$$E[Y | X_{\pi_2}] = [a + b_2] + [b_1 + b_3][X] \text{-----} 14b$$

Should the foregoing procedure indicate that the main effects of the model return significant F -values, while group membership does not significantly effect compensation either directly or by way of interaction with other main effects, it would imply that the regression equation for groups π_1 and π_2 are equal in slope and intercept. This would suggest a fair compensation system. Alternatively, should D have returned a significant F -value the result could forward the applicant's *prima facie* case of unfair compensation discrimination. This would imply a constant group-related discrepancy in average compensation at any given performance worth level. Similarly, should $[X_p * D]$ have returned a significant F -value [$p < 0,05$], the result could forward the applicant's *prima facie* case of unfair compensation discrimination. This in turn would imply that the discrepancy in average compensation between members of protected and non-protected groups increases (assuming a positive b_3 value) with an increase in worth. With reference to the previous section, it may be supposed that the court is more interested in whether illegal discrimination affects compensation and is less interested in how.

2.5.2.5 Adjusting Pay to remove Discrimination

The question of back pay arose outside of litigation, when salary studies were undertaken at American universities using a regression based evaluation kit. Many of the universities flagged inequitable salaries of the disadvantaged group for review. In their review, Gray and Scott (1980) found this to be unjustified as this firstly assumes the discrimination is made on an individual basis and not by group wide systematic influence. Secondly, discrimination is incorrectly identified as those salaries falling below the regression line as statistical regression is based on the least-squared method, where the algebraic sum of the residuals must be zero - such a rectification would result in the previously advantaged group having the same claim, as was the case in Board of Regents versus Dawes (1975). As the regression line shows a pattern of discrimination, flagging those below the regression line, neglects those of the disadvantaged group falling above the regression line. Should discrimination be non-existent, the sum of residuals should be zero, barring this, it does not mean that only the cases falling below the line are subjects to discrimination. In extreme cases, flagging occurred for those of the disadvantaged group who fell one or two standard errors below the regression line or whose negative residuals were larger than the largest negative residual of the advantaged group. Gray and Scott (1980, p. 178) questioned the logic of this approach as

The justification that lesser fluctuations are “chance” ignores “the chance” has somehow managed to place nearly all of the women below the regression line instead of the expected distribution on both sides. Moreover, since the extremes are poorly determined, there is little reason to believe that such cases represent the only victims if indeed they are victims at all.

While this would be the case if two separate regression lines are used, it could be argued that a moderated regression model, using a dummy variable, the dummy variable’s partial regression coefficient impact provides the magnitude of average unfair adverse impact (assuming no interaction effects). This also applies to of the partial regression coefficients associated with both the interaction term and the group main effect.

A case-by-case analysis is useful for isolating particular cases to discover factors, which were not explained by the former analysis. However, by following this approach, Gray and Scott (1980) and Gregory *et al.*, (1999) argued that this would render the regression analysis as only a tool to identify the existence of discrimination, when the organisation would have to flag every member of the disadvantaged group for review, renounce the usefulness of regression analysis.

In Board of Regents versus Dawes (1975), the court having foreseen no problem in compensating all women within a certain defined class, battled with how the class was to be defined for that purpose. Gray and Scott (1980) however have advocated that the appropriate remedy is a statistical one, whereby the disadvantaged group’s regression line must be brought onto par with the other group’s as it is inappropriate to apply an individual remedy to statistically observed discrimination, largely to the difficulty in isolating individual cases (Gray & Scott, 1980).

Regression slopes allow the researcher insight into the manner and extent to which, and the groups differ. In the selection context, if the measure of predictor contains bias, or illegal discrimination causes inconsistent relations between the predictor and the criterion between groups, the regression lines can be adjusted to compensate as per Cleary’s model of selection fairness (Arvey & Faley, 1988). This however cannot be the case in the compensation context as the model lacks an objective criterion. In selection building the appropriate group-related terms into the regression model can eliminate systematic group-related over- and under prediction and the selection decision-making can therefore be made fair. In the compensation context, this is not the case as compensation level is not a criterion. If the regression weights associated with the group main effect and/or the interaction term are significant it only signals that fact that group membership accounts for differences in remuneration that cannot be accounted in terms of legitimate factors. The only way to remedy this is to adjust the compensation

levels associated with those individuals where compensation was too high or too low. This could be accomplished by solving the appropriate multiple regression equation for members of the disadvantaged group as if they were members of the advantaged group and to adjust the current compensation to the expected compensation value. Alternatively, the organisation would have to flag every member of the disadvantaged group for review. This is the case in the United Kingdom, where all those wishing to benefit from a favourable equal pay decision must file separate applications and are in the meanwhile often subjected to victimisation (Gregory *et al.*, 1999)

2.5.3 The Exploitation of Regression Analysis in the United States

Statistical analysis is a complex and sometimes controversial analysis technique so it is understandable why regression analysis, as a procedure, would be subject to scrutiny. The fact remains that courts require a method to gather information about employer behaviour, and sift out systematic discrimination. As mentioned previously, a regression model, if developed in an ethical and controlled fashion, divorces the issue of actual fairness from the issue of how the parties feel about the issue, thereby forwarding a less tainted representation of the organisation. Regression analysis has the potential to reduce the employment process to an objective, measurable description devoid of the employee perceptions and employer motive. Regression analysis offers a powerful tool, if not the only tool with which to investigate compensation discrimination. As the use of regression became accepted and successful during litigation in the United States, a number of arguments were made indicating the shortcomings and pitfalls of regression analysis in this context.

Recent court decisions... have made abundantly clear that evidentiary presumptions based on multiple regression will be carefully scrutinized, and that inadequately prepared statistics will be rejected. In the legal context, multiple regression is both a Mecca and a minefield (Norris, 1987, p. 63).

The danger therefore seems to exist that should regression analysis not be properly understood by the courts, the courts would be unable so to stem or control its accompanying, often complex, arguments and counterarguments. Should this be the case, it is likely such a tool would be butchered into nothing more than a party trick.

Perhaps the most difficult task facing the courts is the evaluation and assessment of statistical analyses and opinions, especially in cases where there is conflicting statistical testimony. Courts are often confronted with conflicting statistical testimony based on different types of information, analyses and judgments, because statisticians disagree but also because courts rely on the presentation of selected evidence favoring different points of view... Yet the complexity of statistical issues raised in some cases will clearly put conflicting expert testimony beyond the ken of even the most thoughtful and well-trained jurist (Feinberg cited in Coulam & Feinberg, 1986, p. 306).

Judge Winner criticised the statistical approach in *Otero versus Mesa County Valley School District* (1979) declaring that discrimination litigation had become “contests between college professor statisticians who revel in discoursing about advanced statistical theory... judges are quite handicapped in trying to understand this testimony” (in Finkelstein, 1980, p. 737). As alluded to in Section 5.5.2.1, it is possible for a regression model to be concocted to fit the data well, either through maliciousness or ignorance. This is as Fisher (1986, p. 285) wrote:

It is tempting to stun the audience with proclaimed expertise together with computer output and professionally drawn visual displays. By pandering to the belief that econometrics is in fact black magic and the statistician the shaman of the computer, it may be possible to overawe the untrained.

The above four citations paint a bleak future for regression analysis. However, fault lies not with the tool, but rather with its use. Regression analysis requires the satisfaction of many assumptions can be subjected to manipulation and has many limitations. During litigation, many of these issues may be solved or circumvented by a systematic and controlled court process. A great deal of the process lies in how the information is communicated and the tactics, which both parties employ to further their case. This argument begs the need to establish best practice guidelines on how compensation discrimination should be evaluated with regression analysis. This requires the input of business, unions, the legal profession and academia, to develop an agreed upon guidelines with which the courts may evaluate statistical evidence of compensation unfairness.

Statistical procedures offer a great deal to both the advancement of compensation practices and the proof required in vindication. The advent of computerised human resource systems has made statistical applications more accessible to management. Decisions are often based on quantifiable measurements, and retained on computer record.

Fisher, (1980) stated that should regression be used properly and be ethically interpreted to the courts with proper attention given to its potentials and limitations, it would render a truly a valuable asset in legal proceedings. While computer packages appear user-friendly and the basic routines are explained reasonably well, the underlying concepts nevertheless require a basic level of knowledge and insight before any meaningful value may be found. A responsibility lies with management and the courts, to ensure ethical and accurate decision-making.

In light of the above, the following sections contextualise multiple regression analysis in the compensation context, dealing specifically with the issues specific to this application.

2.5.4 Regression Analysis in Context

Regression analysis typically attempts to fit a model onto the data which best describes the trend. The regression model is calculated by fitting the regression hyperplane (multiple predictors) onto the data in a position, which minimised the sum of the squares of the data points. In order to calculate this plane accurately, the model is subject to a number of assumptions.

2.5.4.1 Assumptions of the Least Squares Regression

Should the data be judged suitable for regression analysis, the outcomes and credence of the regression analysis must be interpreted in relation to the assumptions made. For the most part, the data used in compensation discrimination cases meet these assumptions. A thorough analysis of the residuals provides importance evidence on the appropriateness of the regression, and is required before such evidence may be admitted into court. The ability of the model to conscribe to the assumptions, are often subjected to criticism during litigation. These assumptions are:

- The normality of the conditional criterion distributions
- Independence of the disturbance term
- Absence of multicollinearity
- Homoscedacity is present
- Linearity
- Absence of Outliers

2.5.4.1.1 Normality of Distribution

The normality assumption, assumes that for all values of X , random error follows a normal distribution (Fisher, 1980). That is, “the entire population is decomposed into several subpopulations – one for each fixed X – wherein the random variable Y is distributed according to a particular density $f(Y|X)$ ” (Berenson *et al.*, 1993, p. 203). Levine *et al.*, (1997) advised the evaluation of the normality assumption with Studentised residuals. By plotting out a histogram of these residuals, the data resemble a (bell shaped) normal curve, should this assumption be met. The closer the residuals portray a normal curve, the more efficient and precise the probability statements become regarding the accuracy of the least squares estimates (Fisher, 1980). Regression analysis is nevertheless rather robust against departures from normality (Levine *et al.*, 1997). Although, it is unlikely that the data, in

this context would present extreme deviations from a normal distribution, nonparametric tests are available (Howell, 1999).

2.5.4.1.2 Independence of the Disturbance Term

This assumption, according to Fisher (1980), is violated when a large systematic factor has been left out of the analysis. By failing to include factors, which determine compensation, the model is rendered biased and inconsistent. However, as the sample size becomes larger, it would become easier to extract true estimates from the random error part.

2.5.4.1.3 Absence of Multicollinearity

The problem of multicollinearity is presented when predictor variables, which are strongly correlated, are used conjunctively in the model. This threatens the stability of the regression coefficients. Due to the interrelatedness of the employment processes, there are a number of possible scenarios where multicollinearity may occur. It is common to find that employees' qualifications are highly correlated to the performance in the job. Better qualifications typically lead to a higher quality or quantity of output. Often rational for promotion, the higher performing employee will soon move to a higher job grade. Similarly, an employee's experience (its proxy being tenure) would result in better performance.

Multicollinearity involves a separate relationship between independent variables. The less multicollinearity is present, the better the researcher would be able to separate the effects of the independent variables on the dependent variable (Fisher, 1980). Most statistical packages are able to detect multicollinearity using default guidelines, deleting highly correlated variables already in the equation. Tabachnick and Fidell (1989) offers ridge regression as a possible solution to this, but warn of potentially serious shortcomings of this approach. The statistician would be required to pose the issue as whether ridge regression might better suite the compensation context, on logical standings, rather than opting for statistical simplicity.

The problem of multicollinearity is avoided should the researcher follow the method proposed above, as only variables that explain unique variance in compensation are taken into account by X_{comp} .

2.5.4.1.4 Homoscedacity

Homoscedacity, as explained by Levin *et al*, (1997) refers to the assumption of constant variation of Y around the regression line for high and low values of X . In the compensation context, the researcher must ensure that this is indeed present. While compensation practices may be highly formulised at lower job grades, it is rare for this to be the case at higher job grades, in a South African organisation. This may be attributed to two factors, firstly, concentration of unionised workers in the lower hierarchies, as opposed to middle and top management strata; and secondly, as job worth increases assignment of compensation, isolation of compensable factors becomes a progressively more problematical task. This is highlighted by the contentious issue of executive pay and “golden handshakes.”

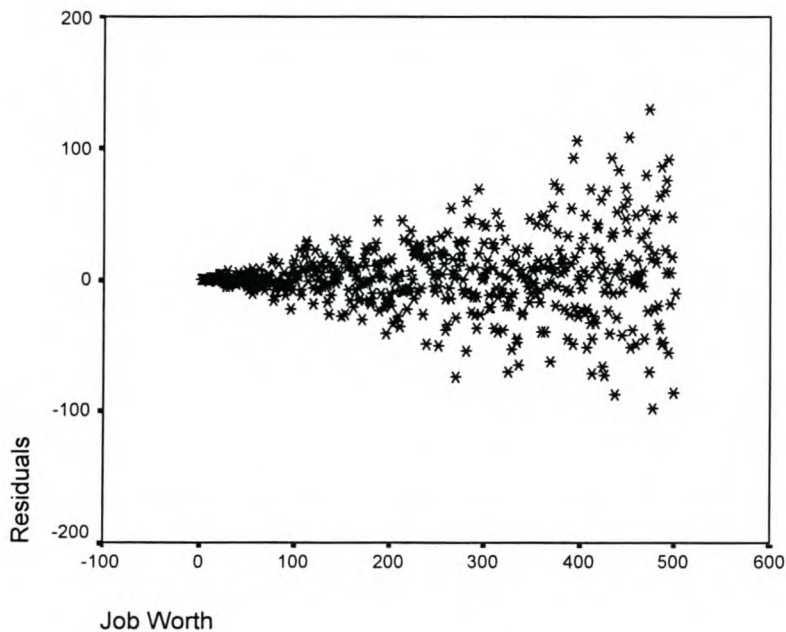


Figure 4: A Depiction of Homoscedacity

Compensation practices may differ greatly as employees move into senior management, where compensation packages are often negotiated on an individual basis, particularly in cases of external recruitment. It is likely that on review of the standardised residuals, a “fanning effect” may appear as described by Levine *et al*, (1997, p. 565). Such residuals are shown in Figure 6. Although not all of the model would become questionable, should this be the case, the violation of this assumption would negatively affect indices such as the standard error of estimate, and the confidence intervals.

2.5.4.1.5 Linearity

It is likely in the context of compensation modelling, to be confronted by a non-linear relationship between job worth variables and compensation. As job worth increases, it is likely that compensation increases at an increasing rate. As pay curves typically are curvilinear, caution must be taken when fitting the model. Although fairness can still be tested, in a manner similar to the procedure proposed above, it raises the issue how group effects would be factored in (linear or curvilinear). Statistical details and data from case law found in the literature (Conway & Roberts, 1983; 1984; 1986) make no mention of this eventuality and model linear pay lines. The ramifications of this issue nevertheless require investigation. Such a model may be termed:

$$E[Y | X] = a + b_1 X_1 + \dots + b_i X_{1i} + b_{11} X_{1i}^2$$

where b_{11} accounts for a curvilinear effect.

Although no mention is made in the compensation literature concerning the non-linear nature of the job worth variable, it is worthwhile to point out that caution is warranted when applying a linear (or curvilinear) regression line to data which is by its nature “stepped.” An example of this is the job grading system. A lack of linearity in residuals does not render the analysis useless, but does weaken it (Tabachnick & Fidell, 1996).

A job evaluation score is usually a continuous variable, while the job grade (which more directly determines compensation) is a categorical variable, perhaps increasing in five increments over the entire organisation. While this is a potential and unspoken drawback, it could possibly be avoided by reverting to the continuous scale. This would also remove the possibility of “Gerry-Mandering.” The removal of job grades could have extensive consequences to the compensation practice, should this issue be explored by statisticians and recognised by the courts. Careful consideration and further research into this issue is required.

2.5.4.1.6 Outliers

Descriptive statistics are intended to express, in a single number, a characteristic of the data set. Should extreme values in the data set be present, these tend to render poor measures of the statistical characteristic in question (for example, central tendency, dispersion, regression coefficients) as these extreme values exert undue leverage on the statistic (Kinnear & Gray, 2000). In univariate data, for

example, the job worth score of the chief executive officer could possibly be interpreted as an extreme value, due to the effect it would have on the ability of the regression model to represent the compensation of non-executive employees. This scores associated with executives would clearly stick out of the data. The regression model essentially is unconcerned with the fantastical world of executive pay, and the inclusion of which would not aid the aptness of the model. Since the chief executive qualifies as an (multivariate) outlier because of his/her extreme job worth score and extraordinary pay, rather than data recording and/or capturing errors, the troublesome observation can, however, not summarily be deleted from the data set without careful deliberation. Fortunately, the exclusion of such outliers in some cases could be warranted, as the purpose of analysis is more concerned with systematic disparities over the general organisation. It is unlikely either litigant would care to delve into the controversial of executive pay. Dispute between litigants would only arise if this approach changed the outcome of the model. Multiple regression analysis is, in the current labour market, ill suited for analysing executive pay.

McCabe (1980) emphasised the danger of outliers as in some cases it is possible to show how the statistical significance can be lost or found, by the raising or lowering of a single individual's salary. In this case, McCabe (1980) suggested the careful plotting and examination of residuals, for the detection and removal of outliers in the data. Outliers do not necessarily indicate unfairness, but threaten the credibility of the regression results. In the absence of illegal discrimination, outliers would indicate either data recording or capturing errors or real but rare observations due to extreme values on one or more of the variables in the regression model.

A number of test statistics are capable of detecting outliers, namely excess range, deviation, sum of square, high-order moment and extreme location statistics (Barnett & Lewis, 1987). The more common version of the above is the box and whisker plot (Howell, 1999; Kerr, Hall & Kozub, 2003). Portnoy and He (2002) however explained that traditional methods to detect outliers suffer from a phenomenon called masking, where outliers cannot be identified due to their number and similarity. Multivariate outliers are probably best detected by calculating the Mahalanobis distance for each observation from the centroid of all cases in the multivariate independent variable space (Tabachnick & Fidell, 1996).

2.5.4.2 Inferential Statistics

In order for the statistician and court to assess the ability of the regression model to explain the set of data, it is subject to scrutiny by way of indices. As separate measurements, these indexes are meaningless, but when considered together, they serve as a guide to the aptness of the model. This “goodness-of-fit” however, only refers to the ability of the model to describe the data, and is separate from the issue of the ability of the regression model to portray the actual employment process. The accuracy of the model to reproduce the actual employment process, the reliability and validity the measurements of job worth and the size of the sample groups, impact on the quality of inference, or credence of information gained from the analysis.

On presentation of the regression model, the following indices are presented to the court:

- (1) The standard error of estimate;
- (2) The co-efficient of determination;
- (3) Confidence interval estimate for the expected value;
- (4) Test for the significance of R; and
- (5) Significance of partial regression coefficients.

2.5.4.2.1 The Standard Error of Estimate

The regression line is fitted so that Y is minimised. The standard error of estimate measures the variability around the fitted regression line (and essentially is a measure of standard deviation) and is defined as equation 15:

$$S_{yx} = \sqrt{\frac{\sum_{i=1}^n (Y_i - E[Y|X]_i)^2}{n-2}} \text{-----15}$$

where Y_i is the actual value of Y for a given X_i , and $E[Y|X]$ is the predicted value of Y for a given X_i (Tabachnick & Fidell, 1989; Levine *et al.*, 1997).

The standard error of estimate describes the average deviation of the actual values of the dependent variable in a particular sample, from the values that are predicted by the calculated regression line. A perfect fitting regression model would therefore return a zero measure and larger residuals indicate less of the dependent variable variance being explained by the model. The standard error of estimate does not measure:

- the probability that the effects of those variables are zero; or
- how large the effects of the random element are on the researchers ability to measure the systematic part of the model,
- nor is it an estimate of the importance of the random part of the model (Fisher, 1980).

In the strictest sense of the legislation, as mentioned before in Section 2.5.2, a single mathematical equation applied to the entire population, without deviation, is in the boldest and most demanding interpretation of the legislation, required to shift the burden. In this case, a large error term is similarly not proof of illegal discrimination. The error term would indicate deviation from the pay line, alluding to a violation of compensation fairness, but due to other factors such as choice and operationalisation of explanatory variables, missing, proxy and unreliable variables; this cannot be equated with indisputable proof of discrimination. Although the litigant has a strong case, the judge must nevertheless evaluate in the context of how the model was developed, and whether this model adequately represents the actual compensation system.

2.5.3.2.2 The Co-efficient of Determination

The total sum of squares for $E[Y | X]$ is separated into the sum of squares due to the regression and the remaining residuals as given by equation 16:

$$SS_y = SS_{reg} + SS_{res} \text{ -----} 16$$

The sum of squares regression, as the proportion of variance explained by the predictors are represented by equation 17:

$$SS_{reg} = \sum (E[Y | X] - E[Y])^2 \text{ -----} 17$$

and the sum of squares residual, as errors in the prediction, as equation 18:

$$SS_{res} = \sum (Y - E[Y | X])^2 \text{ -----} 18$$

By relating the sums, the coefficient of determination is represented by equation 19:

$$R^2 = 1 - \frac{\sum_{i=1}^n (Y_i - E[Y|X])^2}{\sum_{i=1}^n (Y_i - E[Y])^2} \text{-----} 19$$

where Y_i is the observed dependent variable and $E[Y|X]$ is the predicted value of Y_i after the model has been fitted (Berenson *et al.*, 1983; Tabachnick & Fidell, 1989).

R^2 is therefore the measure of proportion of the sum of squares of deviation of Y_i about the mean which can be accounted for by the independent variables. R^2 is a way of standardizing the standard error of estimate, and should be interpreted as such. The higher R^2 , the larger the association is between the dependent and independent variables.

Fisher (1980) warned to the temperamental nature of R^2 , to be influenced by trivial changes in the model. It nevertheless is a common measure, and suitable for litigation, should the parties understand the manner in which it is to be interpreted, instead of rallying the judge to award favour solely on a boast of a higher R^2 .

Barrett (1974, p. 19) entered an unfortunate conclusion:

...in analysing two or more sets of data, predictions for a regression equation based on a steep regression surface with a larger R^2 might not be more precise (or could be less precise) than the predictions based on an equation with a surface not so steep with a smaller R^2 .

That is, assuming R^2 is fixed, an increase in $\sum_{i=1}^n (Y_i - E[Y])^2$ would increase with a steeper surface, and therefore increase R^2 . Regardless of this, comparing R^2 across different data sets would not permit the conclusion that the prediction is more accurate where R^2 is larger. For the sake of the court, this argues that litigants use the same data set should sampling be required.

As R^2 is always a positive index, the sample R^2 chance fluctuations around the population value, all fluctuations measure as a positive value. As the sample value decreases, the magnitude of the chance fluctuations increases. In order to account for capitalisation on chance, Wherry (in Tabachnick & Fidell, 1989) provided an adjusted R^2 measure expressed as equation 20:

$$\tilde{R}^2 = 1 - (1 - R^2) \left(\frac{N-1}{N-k-1} \right) \text{-----} 20$$

where N is the sample size, k the number of independent variables.

Brown (in Tabachnick & Fidell, 1989) provided another version of the above.

2.5.4.2.2 Confidence Interval Estimate for the Expected Value

Once the researcher has established R^2 , the researcher calculates the confidence interval estimate, which is used to make inferences of the average predicted compensation (Levin *et al*, 1997). The equation is represented by equation 21:

$$E[Y | X]_i \pm t_{n-2} S_{y/x} \sqrt{h_i} \text{-----} 21$$

where \hat{Y}_i is the predicted compensation, $S_{y/x}$ the standard error of estimate t is the Student's t distribution and h_i equals $\frac{1}{n} + \frac{(X_i - \bar{X})^2}{\sum_{i=1}^n (X_i - \bar{X})^2}$.

By plotting the confidence interval limits above and below the regression line, the statistician is able to judge a confidence of prediction. That is, given a certain job worth, between which two maximum and minimum levels could the individual expect to be compensated. A lower standard error of estimate and a larger sample size would decrease this measurement. An analysis of the confidence bands is valuable in ascertaining the model's ability to predict the relationship.

2.5.4.2.3 Test for the Significance of R

The partitioned variances may be inserted into an ANOVA table where the F -statistic is calculated to test for a significant regression line. The F -statistic tests the null hypothesis: that there is no correlation between the collective set of performance worth variables and compensation (Howell, 1999). The null hypothesis is rejected if $F \geq F_{1-\alpha;1,n-2}$. The statistic is calculated as $F = \frac{MSR}{MSE} \sim F_{1,n-2}$ (Berenson *et al.*, 1983).

2.5.4.2.4 Significance of partial regression coefficients

While the F-statistic referred to in the previous paragraph tests the ability of the regression line to fit the data, the t-statistic is used to test whether each regression coefficient is significantly different from zero (although, as indicated earlier a partial F-ratio could also be utilized). That is, testing for a relation between the independent variable and the dependent variable (holding constant the remaining independent variables), that is, the likelihood of β_i (the true slope) being nil (Levine *et al*, 1997). Given only one predictor, Howell (1999, p. 187) calculated the t-statistic as:

$$t = \frac{r}{\frac{s_{Y-\hat{Y}}}{s_X \sqrt{N-1}}} = \frac{r(s_X)\sqrt{N-1}}{s_Y \sqrt{(1-r^2)\left(\frac{N-1}{N-2}\right)}} \text{-----}22$$

The t statistic is compared with the t-distribution at the calculated degrees of freedom and desired significance level, upon which the coefficient may be found statistically significant. With simple linear regression, the finding of b as statistically significant is the same as finding the slope statistically significant. This regression coefficient is significant on the basis that it is the only regression coefficient (Howell, 1999). This may be extended to test a multiple regression model as:

$$t = \frac{b_k}{S_{b_k}} \text{-----}23$$

where S_{b_k} represents the standard error of regression coefficient b_k , the t statistic for a t -distribution with $n - P - 1$ degrees of freedom, and P being the number of explanatory variables in the regression equation (Levine *et al*, 1997). Should this value fall within 0.05 level of significance at $n - P - 1$ degrees of freedom, the null hypothesis would be rejected, and it may be concluded that the explanatory variable has a significant relationship with compensation while controlling for the influence of other variables in the model.

The calculation of the t -statistic is one of the key areas the judge would look at, referring to the five percent and one percent significant levels as the generally accepted benchmarks. These levels are however, not absolute and must be considered within the context of the model presented and the accompanying theoretical foundations. Fisher (1980) argued that the researcher should never eliminate a variable, which has firm theoretical arguments as motive for inclusion, on the basis that in its effect is not significant or hampers the model. This however seems to detract from the purpose of testing the

model. It is questionable that the researcher be prepared to either discard the model that is found to be in error, or explain away the evidence, which contradicts the original assumption.

The *t*-statistic allows the calculation of the range of values for each weighting factor within a ninety-five percent level of confidence. The original Note (1975) was confident in this clear delineation between significant and insignificant probabilities holding the return of a significant *F* - and *t*-statistic as positive and undisputable evidence. It however must be added that although a measure is significant, the effect size of the independent variable (that is a, compensable factor), may not necessarily large enough to impact upon the compensation system. Unfortunately, the verdict on explanatory variables is not always as neat, as variables which do in reality play a role in determining compensation, may return insignificant in the sample group, and *visa versa*, falling just above or below the benchmark significance level. This emphasises the importance of causal modelling and the interrelatedness of all steps in the regression approach. The researcher is obligated to verify these findings in relation to the actual employment process

2.5.5 Issues Encountered during Litigation

The misuse of regression analysis in the compensation discrimination context may be generalised into the five points offered by Levine *et al.*, (1997, p. 584):

- Lacking an awareness of the assumptions of least squares regression;
- Knowing how to evaluate the assumptions of least squares regression;
- Knowing what the alternatives to least squares regression are if a particular assumption is violated;
- Thinking that correlation implies causation;
- Using a regression model without knowledge of the subject matter.

Following numerous cases where the various parties misused regression analysis, Barrett and Sansonetti (1988) entered a telling paper reviewing issues surrounding the use of regression models in compensation discrimination litigation, which followed the Bazemore versus Friday case (1986). Barrett (cited in Barrett, Alexander, Anesgart & Doverspike, 1986, p. 154) argued that,

Regression analysis can lead to the inference in compensation under conditions where there is no legal discrimination. This has had the effect of improperly shifting the burden from the plaintiff to the defendant... This result from regression analysis comes about because of a number of paradoxes and

fallacies in using the approach. At this point, the burden should be upon the individual using the regression analysis to show that it really does lead to an accurate assessment of discrimination.

While the method offers many advantages, for the reasons listed below, regression analysis is not always appropriate for use in every case. As most of these issues involve the manipulation of the model, a court attuned to these issues would be able to firstly curtail much foul play and secondly be able to evaluate statistical evidence in the context of the known issues. Those responsible for submitting and scrutinising regression analysis would best be wary of the associated pitfalls and vulnerabilities. Much time and effort could be saved should South African courts review the issues, which arose with the use of regression analysis evidence in America.

These were:

- The use of inappropriate variables to explain compensation differentials;
- Attempting to factor in qualitative factors;
- The exemption of unobserved variables;
- The processes behind the improvement of a model;
- The inclusion of pre-act hires;
- The size and use of different samples;
- The argument of reverse regression;
- The problem of missing data;
- One group dominating the sample;
- Interaction effects; and
- The problem of back pay.

2.5.5.1 Inappropriate Variables

The most notorious problem surrounding the use of such regression models are debates surrounding the legitimacy of the variables chosen for use in the regression (Barrett *et al.*, 1986). The judge in *Stastny versus Southern Bell Telephone and Telegraph Company* (1978) did not take the regression analysis of the parties into consideration stating: “Regression analysis begins with the assumption that certain independent variables in fact determine the outcome of decisions to raise pay and promote. Such assumptions are intellectually questionable and not grounded in any solid evidence” (Finkelstein, 1980, p. 740).

The above argument can be avoided, in part, by first empirically testing the claim that specific variables do explain unique variances in compensation, and systematically linking these variables, by means of supplementary evidence, back to the actual compensation system. In this sense, a formal compensation system would dramatically assist the defendant's case (and possibly avoided litigation). The judge in the Stastny case, however referred to those variables, which the defendant (figuratively "grasping at straws") selected, on the grounds that they seem to/should explain compensation level. The problem being that, most of the commonly known variables, to an extent, would (modelling a complex labour market) correlate with compensation. The judge however was in hindsight, concerned that the failure to use the actual variables from the compensation system might render an analysis, which might not approximate the actual compensation system, and therefore exaggerating or concealing illegal discrimination to varying degrees.

Below are some of the variables, which were regarded as suspect by the American courts (Barrett *et al.*, 1986; Finkelstein, 1980; Gray & Scott, 1980):

- Skill level (inappropriately defined);
- Gender (in contention as a legitimate variable);
- Education level (not linked with job requirements);
- Veteran status (as a pre-text for illegal discrimination); and
- Occupational prestige (as a pre-text for illegal discrimination).

Although James versus Stockham Valves and Fittings Company (1977), was a selection discrimination case, the court spoke to the use of certain predictors, which could be of issue in the compensation context. The allegation involved obstruction of black employees into higher paying jobs. The defendant failed to meet the burden of proof when attempting to explain why black employees earned less than did white counterparts. The expert witness used years of schooling, achievement, seniority, skill level, outside craft experience, outside operative experience, absenteeism and merit ratings to explain wage differential on the basis of differences in productivity. This could quite likely be the case in the compensation context due to the lack of, or in contest of the organisation's formal performance appraisal system. The court found that skill levels and merit ratings were defined in a manner, which incorporated illegal discrimination. This was due to the skill level quantification being derived from the employee's "job class". The court found that, "a regression analysis defining skill level in that way thus may confirm the existence of employment discrimination practices that result in higher earnings for whites" (cited in Finkelstein, 1980 p. 739). The court confirmed racial bias in the

subjective evaluations of white supervisors (as claimed by the plaintiffs). Bias would therefore have been present in the regression analysis.

In *James versus Stockham Valves and Fittings Company* (1977), marital status was also used to explain differences in productivity. The rationale being, that married men are more attached to the workforce than married women (working longer hours over a longer, unbroken career). According to Finkelstein (1980), for this evidence to have held, a marriage variable must be included for each sex. Should the court recognise as married men are more productive; at least some of the salary difference attributed to gender would be shifted to the marriage variable. However, this shift could also hide discriminatory practices should an employer pay married men more than a married women, believing that married men are the more deserving, principle support for a family. A better approach to account for differences in pay based on this rationale would be to use proxy measurements such as absences or gaps in service. The judge in this particular case however found that months in “salary class” was subject to the same flaw as salary class and years of schooling was male-biased discrimination as the employer previously refused to hire women with college degrees.

The case law is contradictory on whether academic rankings may be submitted as a variable. In *Mecklenburg versus Montana Board of Regents of Higher Education* (1976), the state university defended allegations of discrimination against woman. Here the court found, “... the salary study was done within each rank, it was impossible to catch any discriminatory salary treatment resulting from inequities in promotions” (cited in Finkelstein, 1980, p. 741). This approach differed in *Presseisen versus Swarthmore College* (1977) where the plaintiff excluded academic rank, as an explanatory variable owing to the fact that women took longer to attain a given rank than men. The court found that rank should have been incorporated with proof that it was linked to sex (Gray & Scott, 1980). This seems the more prudent of the two approaches. Although both parties’ claims in this case were finally rejected, a rebuttal study during the case was put forward, aimed at meeting the objections of the initial study, showed difference in gender in time to promotions. The court had incidentally refused the previous study, as sufficient proof of discrimination was lacking in the form of statistically insignificant differences. However, as Finkelstein (1980) pointed out, the absence of statistically significant differences is not affirmative evidence that promotions were made neutrally. Hence, the inclusion of rank in the study would erroneously explain away differences in salary even though it is not statistically significant. This does not bar the inclusion of rank as an explanatory variable – should clear evidence be presenting before hand, confirming that the selection system is unbiased, objective and consistent.

In the debate on the appropriateness of variables to include in a compensation litigation regression model, issues of selection discrimination and compensation discrimination tend to merge. This is evident in the foregoing discussion. However, it is important that they are not confused in litigation. The onus on the defendant is to defend *prima facie* evidence of compensation discrimination. The former issue only enters the fray in matters where the selection indirectly determines compensation. This would be the case in *Commonwealth versus Local 542* (1978) where the plaintiff's regression study showed "hours worked" as a discriminatory variable. The plaintiffs reported to hiring halls, where employers compensated a wage according to hours previously worked. The study took into account: age, geographical district, branch, seniority and list status (union tenure). Finkelstein (1980) reported that the defendant objected that this analysis failed to take account of skill differences. The court rejected this claim as that there was no evidence that skill varied by race, or that it was not accounted for by the already included variables. The available data on skill was deemed by the plaintiff as unreliable and lastly, to the extent that skill might be gained from experience, is inappropriate factor in this case, as the plaintiff's claim was the deprivation of the opportunity to gain experience. The blurred relationship between compensation discrimination and selection discrimination will be referred to again below in Section 2.5.5.7.2.

Seberhagan (in Barrett *et al.*, 1986) referred to the rather extreme combination of mental ability tests, achievement motivation, veteran status and occupational prestige as explanatory variables. It is, however, doubtful whether many South African organisations would consider specious variables when determining compensation. It is not considered acceptable to base compensation on characteristics of the incumbent rather than performance.

Finkelstein (1980) concluded the following:

- A variable may not reflect a position or status bestowed by the employer, in which case the variable may be tainted by discrimination.
- A variable may not reflect factors unrelated to productivity, in which case its inclusion may conceal discrimination if it correlates with group status.
- A variable related to productivity may not reflect a qualification, which, has been denied to an employee group through the employer's discrimination.

The above cases are understood to explain why variables must first be shown to not only be unbiased but also reliable and valid. However, should the objective be to model the employment process, it

must also be asked of the defendant to show that the variables reflect genuine variables actually used by a compensation system. In the simplest sense, it must be questioned as to whether it is correct to use academic qualification to explain variance in compensation, if it has not as such been used to determine compensation. While such academic qualification is a permissible and reasonable inherent requirement or performance determinant of jobs in general, it is not necessarily the case and may at worst be used to conceal illegal discrimination. In this example, the use of academic qualifications would therefore be biased toward a group.

2.5.5.2 Qualitative Factors

These variables serve as proxy variables, that is, surrogate variables which approximate difficult to measure variables. The courts, according to Barrett and Sansonetti (1986), have been cautious of accepting the use of proxy variables. By way of example, it is assumed that the experience of an individual influences productivity, however as experience cannot be measured, age is used as a substitute variable.

In most regression studies, it has been argued, that the results would change considerably should additional qualitative variables be included. Qualitative factors are usually difficult to factor into a regression analysis unless reflected by imperfect quantitative substitutes (or proxy measurements). The American courts have been inconsistent in their approach to this argument (Finkelstein, 1980).

In *Agarwal versus McKee and Company* (1977) the plaintiffs used the following as explanatory variables: minority status, total years of education, number of years since receipt of highest degree, age of employee, age of employee squared, type of professional registration held by employee, years of prior experience, years of experience at McKee, years of experience at McKee squared and the number of years of any break in service at McKee. The court concluded that the plaintiff had failed to meet the burden of proof by excluding variables such as job level, prior salary and past overseas assignments and did not code type or quality of education, which the court felt had a bearing on salary. Finkelstein (1980) disagreed with the courts ruling, as these variables may well be tainted by discrimination. The failure to code the type or quality of education should properly fall on the employer since this is relevant only to the extent that it is validly performance related. Barrett and Sansonetti (1986) reported that most courts required the parties to demonstrate the assumptions made.

2.5.5.3 Unobserved Variables

Problems arise where job related variables are not present in the data. These have been termed “nonobserved” variables (Barrett & Sansonetti, 1986). Court cases have shown that it is more effective to assume these variables as an alternative to total omission. In the Bazemore versus Friday case (1986), the court rules that omission of variables from a regression analysis, although rendering the analysis less probative does not render the analysis unacceptable as evidence. The courts however, have not allowed such an inclusion without proof of a real effect on the final inference, and that the omission of the variable would bias conclusions made from the data (Barrett & Sansonetti, 1986; Fisher, 1986). According to Conway and Roberts (1984) these assumptions can be defended on grounds of *priori* reasonableness, consistency with other empirical studies and where possible, diagnostic checking with alternative statistical models. An example of this is the local status or reputation of an artisan or consultant.

2.5.5.4 Operationalisation of Variables

In Section 2.5.2.1, Fisher (1980) warned of choosing variables to suit the model. The choice of variables influences the fit of the model, its residuals and the indices, to which the court looks in evaluation of the model. However, the courts must be also wary of the purposeful manipulation of variables, through the manner in which variables are defined and operationalised, by which the variables become secondary to the fit of the model. It is possible for a motivated and zealous statistician to produce a strong fitting model to forward an argument, regardless of the nature of the actual employment process.

The manner in which a variable is operationalised or measured, may often have substantial effects on the model. This is often the case of performance variables. McCabe (1980) raised the issue of the performance variables, which often require an aspect of quality evaluation, as performance is not easily quantified. In this case, the issue is raised as to how might the same organisation who allegedly illegitimately discriminates in salary allocation, be expected to provide a fair evaluation of a variable such as quality?

Firstly, as McCabe (1980) argued, should salary be determined in part by a performance measure, and should performance variables be positively associated with salary, and the other groups average more than the plaintiff’s group on these variables, then a linear analysis would overestimate the salary

differential whenever these variables are excluded from the plaintiff's analysis. In short, by adjusting how performance is measured and how much performance measures influence the determination of compensation in the compensation system, the litigants may manipulate discrimination as revealed by the regression model. Emphasis therefore must be placed on how the model was developed, and whether the model mimics the actual employment decisions. The case in point was the recent Morgan versus UPS (2000), where the plaintiff used a two-point rating scale as a substitute for a six-point scale, thereby concealing performance differences (Harris & Suszko, 2004).

Perhaps the better question to be raised is, how might a court expect an organisation who, purposefully or through ignorance, illegitimately discriminates, be expected to furnish the court with evidence to suggest otherwise? The evidence would be tainted by the misgivings of their own employment practices. The internal processes of the organisation or resources allocated to such matters may degrade the value of the court's inquiry, to such an extent when an unintentional but guilty defendant could shift the burden. For this reasons, circumstantial evidence here is important for the applicant's *prima facie* case. Opportunity must be given to the applicant to present an opposing model, to convince the court that legitimate variables cause adverse impact in the way they are operationalised.

The choice of variables has particular importance for the manner in which evidence is presented and cross-examined. Statisticians and lawyers work from different paradigms, which often causes fundamental conflicts during litigation. The court must be able to moderate this process. This is discussed in Section 2.5.6.3.

2.5.5.5 Pre-act Hires

The second most prominent issue concerned the treatment of those individuals who were hired before the Title VII legislation came into effect. Although defendants are not held accountable for the present day consequences of past incursions, they are liable should plaintiffs prove "continued violation." The plaintiff in such as situation attempts to show "pre-act" discrimination, and then argues that the employer did little to change the situation since the inception of the legislation (Norris, 1987). As a related issue: the inclusion of these individuals, still victims of pre-act discrimination, into the analysis will distort the results of the regression analysis, possibly leading to an inference of discrimination, where no discrimination, since Title VII exists (Barrett & Sansonetti, 1986; Finkelstein, 1980).

It is likely that South African courts would encompass the above situation under effect-based legislation, and would be concerned with any form of current inequality. (This does cloud the distinction between the proactive removal of illegal discrimination and affirmative action measures but it is unlikely the court would be concerned with unnecessary distinction). Since South Africa's legislation is concerned with the present, and is accompanied by strong pro-active measures of the Employment Equity Act (Republic of South Africa, 1998) in terms of which organisations must work toward the removal of continuing violation, such "time-barred" discrimination is not a separate issue.

The applicant could firstly, prove past discrimination, by either the "smoking gun" or circumstantial evidence. Should the organisation have since failed to alter pay rates, the judge may be inclined to explore the issue further. Eventually, the applicant would probably be required to show how past discrimination affects the *status quo*. It is unlikely that applicants attempting to show continued violation arising from discrimination in the past, would be handled in a different manner by the court, and should be required to deliver the same forms of evidence to establish a *prima facie* case. Due to rampant overt discrimination during Apartheid, this approach is likely to rely on other forms of evidence, other than regression analysis. The "pre-act" applicant would not be handled differently by the court, although he/she should have a firmer footing, but only by way of supporting evidence.

2.5.5.6 Sampling

A common problem associated with compensation discrimination studies is either insufficient representation of a group in a cohort, or the insufficient size of the cohort to result in meaningful results (Gray & Scott, 1980). Should this issue be contended by either of the parties, the court is at liberty to judge on the aptness of the regression model approach to the case. Statistical guides, such as the power tables of Cohen (1977), are available to assist in this regard.

Finkelstein (1980) suggested that irrespective of whether this should be the case, the parties meet in good faith, and decide beforehand, which data is to be used, how sampling is performed and how cohorts are to be defined, to possibly prevent the court from having to deal with sampling. Granted this approach has merit, it is also possible that sampling is the very contested issue between management and the union, in which case the judge's favour of a particular sampling method or data set, may sway the case. However, should the parties find that sampling issues are not incremental to their dispute; the "two-staged approach" would benefit both parties. Should a judge rule during the hearing, one or both of the parties may find their studies void, and will lack the time to compile a new

regression model or be unable to revise their position. As recently as *Morgan versus UPS* (2000), the parties did not meet beforehand to confirm samplings; the plaintiff lost the case partly due to data errors where a manager boasted a salary of \$642 million (Harris & Suszko, 2004). Should the litigants have decided beforehand to use the same sample, the outcome may have been different.

2.5.5.7 Reverse Regression

Reverse regression centres on an alternative operational definition of fairness. Conway and Roberts (1983), the main protagonists for the case of reverse regression in litigation, claimed that the operational definition offered by reverse regression uncovers features of the data, which would be unapparent in a direct regression analysis. Reverse or indirect regression, seeks to show fairness in terms of the regression of performance worth on salary, holding that a type of fairness exists when jobs of the same salary predict jobs of the same worth. As the use of regression analysis in the compensation context was explored, a heated debate arose between academics over the operational definition of fairness. Anticipating that this issue arise may arise in South African litigation; it is necessary to explicate this debate.

2.5.5.7.1 Background

Initially, Roberts (in Finkelstein, 1980) entered demonstrations of under-adjustment; a problem accrued to the court having no information on the true nature of the employer's assessments of productivity or true productivity. Conclusions were based on a proxy of true productivity with a random error and consequently, a portion of the explanation of differences in salary between groups that would be attributed to true productivity is attributed to gender due to random errors of the proxy (Variation in the proxy of productivity, includes variation which should form part of random error).

In order to examine this problem, Roberts (in Finkelstein, 1980) suggested regressing a single productivity variable on salary and gender. Reverse regression poses whether individuals earning the same salary are equally productive. A statistically significant positive coefficient for gender may then suggest discrimination. Roberts (in Finkelstein, 1980) claimed that this would avoid the above problem, as random error in the salary variable does not bias the estimates of the coefficients of the explanatory variables. It is questionable why Roberts (in Finkelstein, 1980) claimed that random error in one explanatory variable is claimed to cause inaccuracy in inference, but random error in alternative definition does not.

Conway and Roberts (1983; 1984; 1986) advocated the application of two models of fairness to be applied to an organisation. Conway and Roberts (1983, p. 80) defined the two types of fairness as follows:

- Fairness One: “The conditional distributions of income given job qualifications (read performance worth) are the same for both sexes.” This approach involves direct regression.
- Fairness Two: “The conditional distributions of job qualifications (read performance worth) given income are the same for both sexes.” This approach involves indirect regression.

Conway and Roberts (1984) showed that data was capable of concealing the truth if only judged in terms of the first perspective that in order to gauge compensation fairness, both comparisons must be judged in order to gain insight. This is owed to the fact that not all job qualifications are available to the researcher and some may be tainted or omitted. Reverse regression was argued to bring out other aspects of the data, or expose features of the data, which might normally remain undetected.

2.5.5.7.2 Criticisms

The notion of reverse regression was subject to a number of scalding criticisms (Ferber & Green, 1984; Ferber & Green in Conway & Roberts, 1983; Goldberger, 1984; Gray & Scott, 1980; Green 1984; Michelson & Blattenberger, 1984; Miller, 1984). The most prominent of which were:

- Paradoxes in the application of both definitions simultaneously;
- The confusion between selection and compensation discrimination;
- The frequent contradiction in outcome;
- Fairness One seems favoured in terms of the legislation; and
- Fairness Two can be cheated through Tokenism.

a) Paradoxical Definitions

Ferber and Green (in Conway and Roberts, 1983) entered that Fairness One is fair to people while Fairness Two is fair to the job, advocating in favour of the former. Conway and Roberts (1983, p. 84), disagreed with this statement offering the following example:

Suppose that employee A has exactly the same qualification as employee D and finds that D is making \$5000 a year more. Employee A feels – rightly, on the evidence assumed - the victim of unfairness 1. Suppose now that employee A finds that employee R has the same salary, but is substantially less qualified.

Employee A feels, rightly, the victim of unfairness 2. Perhaps employee A would feel worse about one or the other comparison, but it is no sense to compare one comparison personal and the other impersonal.

b) The confusion between selection and compensation discrimination

Salary discrimination and selection or promotion discrimination are interrelated concepts. A plaintiff may often allege compensation discrimination *via* promotion discrimination, as was the case of *Commonwealth versus Local 542* (1978). Conway and Roberts (1983) argued that when evaluating fairness, two approaches must be used. Firstly, regressing Y as the income on X directly, the job qualification or proxy for productivity with group, as is the tended way to investigate salary discrimination. Secondly, by reverse regression of X on Y and group, placement discrimination could be investigated. Using Y as the categorical variable representing ordinal job groups, disparities in the mean measured qualification for each job group can be investigated by group. Conway and Roberts (1983) claimed that in order to evaluate fairness in an organisation, the two approaches, namely comparison of salaries at given qualifications and comparison of qualifications at given salaries, must be considered. This however, in some occasions, renders substantially discrepant inferences. This reiterates the fact that although compensation and selection are interrelated, they are essentially two distinct human resource functions.

Conway and Roberts (1983) continued to admit that unfortunately, the employer cannot always hope for both types of fairness where firstly, there would be an identical distribution of qualifications and income for both of the comparative groups and secondly, there is an clear relationship between income and qualifications, that is, identical regression lines.

Conway and Roberts (1983) noted many more criticisms of the concept of Fairness Two. Finkelstein (in Conway & Roberts, 1983) argued that reverse regression fails to adequately deal with discrimination in promotion due to the incompatibility of selection unfairness and Fairness Two. Furthermore, the Fairness approach, provided job worth is controlled, only indicates that something within the selection/promotion process is awry but would not be able to isolate where or how the discrimination has taken place.

Weisberg and Tomberlin (in Conway & Roberts, 1983) found no place for reverse regression under existing law, and as such argued that differences between groups may exist prior to promotion, since reverse regression does not make provision for pre-existing job qualifications. Promotion would be determined by the employer's requirements and the pre-existing population distributions. Difference

in job qualifications between groups would explain fair adverse impact in selection. Given each group earns the same compensation for equal worth, this would not explain why mean qualification levels differ. This can only be attributed as it was, due to selection discrimination, as members of one group found it harder to reach a job grade. If there are differences in job qualification between male and female, and no selection discrimination, then fewer members of one group would be found at a certain job grade and level. As information on the incumbent is not separated from worth attributed to the job, the representation becomes cloudier.

Gray and Scott (1980) found it inappropriate to run a reverse regression noting that the purpose of the study is to estimate the salary of a member of one group with certain characteristics and compare this estimate with the actual salary of another group with those characteristics. This seems erroneous as the comparison of an estimate is seemingly made with an actual salary. It must again be noted that purpose of compensation discrimination studies is explanatory and not predictive.

Ash (1986) concluded that both forms of regression are capable of producing bias. Direct regression will be bias in as far as the researcher has an imperfect idea of the employees true worth. Reverse regression could also be biased as the researcher does not know what the true worth is, and market forces will lead to errors in the improper assignment of compensation as a function of true worth.

Blattenberger and Michelson (in Conway & Roberts, 1983) advocated the relevance of Fairness Two where an employer applied a formula payment for measured job qualifications and productivity where the formula itself may be a point of contention. Michelson and Blattenberger (1984, p. 122) later concluded that reverse regression is a “nonsolution to a nonproblem.”

c) Contradiction in outcome

Ferber and Green (1984), opposed the application of the two dimensions of fairness, for the reasons conceded by Conway and Roberts (1984) in that the two dimensions, when applied to the data, seldom render the same verdict on fairness. The contradiction, between the two models, poses serious problems both in litigation and practice. Ferber and Green (1984) argued that should promotion discrimination have taken place, salary is the tainted variable, and its inclusion conceals discrimination in respect to awards on salary. It is then incorrect to use salary to determine if promotion discrimination took place, as the analysis is not specific to jobs but to job worth.

d) The interpretation of legislation

The Civil Rights Act (United States Congress, 1964) is according to Ferber and Green (1984), concerned with Unfairness One. That is, the law is concerned with the probability of groups being rewarded with a treatment, (promotion or increase in salary), given a certain job qualification and not Unfairness Two, the probability of a group having a specific qualification level given their allocation to a specific salary (or position) treatment.

Weisberg and Tomberlin (in Conway & Roberts, 1984) also advocated the primacy of Fairness One as a legal standard for proof of discrimination in compensation discrimination litigation. On this issue, Conway and Roberts (1984) disputed Greene (1984) who claimed that Fairness One is the legally defined approach to fairness in general, pointing out that courts have typically refrained from applying any one form of statistical definition. Although the literature commonly uses fictitious data to illustrate possible scenarios, "In actual data, one must often decide which concept is to be accorded the principal weight" (in Conway and Roberts, 1983, p. 84). This is in accordance with Grogan's (1996) view, that fairness must be evaluated in context of the situation before the court.

In contrast to the previous researchers, Green (1984) and Miller (1984) attempted mathematical approaches in order to convene the estimates of discrimination offered by the two models of fairness, but due to their differing assumptions, little headway has been made. Goldberger (1984), introduced evidence demonstrating that both direct and reverse regression can provide unbiased estimates of adjusted income differences by way of two models and expected that the parties be able to choose which statistical definition of distributive fairness is more appropriate to their case. This is dangerous as typically the discrimination coefficient of reverse regression is typically much smaller than that of direct regression. Moreover, the type of regression used should logically be dictated by the type of discrimination litigation (that is, selection or compensation.)

Ash (1986) aptly concluded:

The principle of fairness estimates embodied in the law clearly demands that individuals of comparable qualifications [read worth] have comparable expectation of reward, regardless of sex. An employer who is allowed to behave in a manner that is unfair to women from the perspective of direct regression, so long as reverse regression detects no problem, is, in fact, being allowed to set a woman's salary as function of her membership in the class of women. When a company's women employees are (as a group) less qualified than the men, this makes it permissible to treat women individuals less well than comparable qualified men. Such logic is against both the spirit and the letter of the law, making the use of reverse regression in the courtroom perverse, indeed.

e) Tokenism

Reverse regression is also unable to account for affirmative action policies, or the nature of the selection process. Conway and Roberts (1983) also admitted to this test of fairness requires further exploration due to its vulnerability to be cheated through Tokenism.

2.5.5.7.3 Discussion

Reverse regression seems enticing yet irrelevant, as there are limited posts available, which cannot be filled by everyone with a particular qualification. Therefore, the assumptions on which this operational definition is based are unfounded. By way of example, all top management jobs are given to individuals with Masters degrees in the fields as a valid job related criterion, and should no members from a the plaintiff group possess Masters degrees, no assessment of fairness can be made. Unfairness 2 would probably constitute *prima facie* grounds for alleging unfairness in selection but it would not constitute proof of unfair discrimination in selection or compensation. As reverse regression does not take the number of group members at a given salary level into account but rather the level of qualification. The failure to take every one with a particular qualification is not related to whether different selection hurdles are set for different groups. Reverse regression is only capable of (irrelevantly) showing two different sub groups positioned differently in an organisation.

There also lacks a clear distinction in the proposals offered by Conway and Roberts (1983; 1984; 1986), between those variables, which are included in selection, and those which determine compensation. Although personal characteristics/qualifications are taken into account to determine what compensation a job incumbent should earn, the definition of what is compared to compensation to determine fairness remains hazy. Job evaluation, including market characteristics and performance determine compensation but not selection.

While given equal distribution of groups in an organisation's hierarchy, compensation and performance worth variables should render the same verdict, no matter which way the relation is regressed, however the two concepts of fairness, require different assumptions, the second touches on selection, promotion and transfer fairness, attempting to judge both forms of discrimination at once. The points have been extensively argued to an end, that legislators pick one definition of fairness. Direct regression being the closest extension of the legislation, should take favour, if only that it is unreasonable to expect organisations to operate a compensation system, where there is little hope of conforming to both concepts.

Owing to the above criticisms, should reverse regression be advocated during South African compensation discrimination litigation, it is recommended that courts do not consider reverse regression on grounds that it is impractical, does not coincide with legislation and based on faulty assumptions.

2.5.5.8 Treating Jobs as Comparable

This issue is likely become a contested issue in South Africa and unfortunately one which cannot be circumvented. The question would be raised as to what extent different jobs can be combined into one analysis. In order to make an organisation-wide analysis, different type of jobs have to be compared. The issue therefore centers on the acceptance of comparable worth philosophy. Herein lies a major contradiction in American litigation: Although some courts have rejected the comparable worth approach, they have accepted the use of multiple regression analysis as evidence. This is added to the ambiguity that courts find no fault in comparing job content, in the form of job evaluation systems, but do not fully accept comparable worth.

Regression analysis compares salary data from employees that occupy jobs varying in job worth. Should more than one kind or type of job be present in the study, the regression analysis requires the comparison of dissimilar jobs. Although the job evaluation scores are compared, these scores belong to different jobs. Therefore, comparable worth must be assumed. For example, by placing accountants' job worth scores in the same analysis as truck drivers, the analysis compares the two types of jobs (and invariably job content), in order to detect illegal discrimination. The researcher must assume the qualities of the jobs differ, and that they are scaled in terms of these qualities in the job evaluation system. By running all the jobs in an organisation in one analysis, the researcher is assuming that the jobs are comparable, interchangeable, and don't require unique skills (Barrett & Sansonetti, 1986). That is, one must assume that one job can be measures on the same scale as another. The question whether it is logical or possible to compare jobs (or by way of example, different knowledge, skills, abilities or working conditions) on the same scale, is central to the comparable worth debate.

Discrimination would have to be more prevalent in order to be detected, as sample size decreases. The analysis is probative to the extent to which the job evaluation system can compare a wide array of jobs. There is a contest between the probative value of the analysis and the practicalities and meanings of

comparing dissimilar jobs. That is the larger the size of the dataset, the more probative the analysis becomes but the more different types are required to be present. The more narrow the comparison, for example comparing the truck driver to a warehouse labourer or the accountant to a human resource manager the smaller the sample becomes. The more relaxed the comparable worth assumption, the more jobs are available in the sample.

The argument that it might in some instances be necessary to compare regression lines of subpopulations of the organisation, either by way of department, geographical area or job categories, is valid. However so too is the argument that, by breaking up the organisation into smaller sample samples, the investigative ability of the analysis is reduced and the discriminatory influence in the compensation system would remain unchecked (Barrett & Sansonetti, 1986).

Typically, plaintiffs would have distinct/separate jobs treated as comparable, (under auspices of comparable worth theory,) while defendants would have dissimilar jobs be assigned to separate analyses. The approach of removing job category and rank variables would tend to serve the case of the plaintiff, removing elements of the formal organisation from the model. As compensation system often echoes the structure and hierarchy of the organisation in terms legitimate determinants, the removal of elements from the organisation itself increases the likelihood that the analysis will infer illegal discrimination. The more variables the plaintiff can argue away, the larger the unexplained residuals, which could be attributed to group membership. This is often due to the comparison of unequal distribution of the two groups throughout the organisation. The problem here may lie in the selection process or societal inequalities, which is not answerable by the compensation system. In South African organisations, past imbalances in education and selection, has resulted in the majority of higher paying jobs, and certain job categories being filled by white males. The court should be wary of this, as this issue also confuses selection and compensation discrimination.

Barrett and Sansonetti (1986) reviewed two approaches, which have been attempted by plaintiffs. In first approach, the plaintiffs removed job category from their analysis (Agarwal versus Arthur McKee & Co, 1997; Melani versus Board of Higher Education of City of New York, 1983; Valentino versus United States Postal Service, 1982). Plaintiffs have argued that jobs in the organisation are of similar description and specification, while defendants argued that a single regression line cannot capture differences in jobs, and failing to model job category variables could lead to an inference of discrimination where fair discrimination exists by way of differences in job titles, categories, and experience.

The second approach involved the removal of grade or level in the hierarchy of the organisation. Such a variable is likely to be one of the main determinants associated with job worth. More than likely, this variable is the outcome of a job evaluation score, which is in turn graded. Barrett and Sansonetti (1986) cited Agarwal versus McKee & Co., (1977); Ottaviani versus State University of New York at Paslz, (1988); Sobel versus Yeshiva University (1983) and Valentino versus United States Postal Service (1981) as cases where the court accepted the use of rank, should it already have been shown that no discrimination exists in ranking or promotion practices. These cases were all won by the defendants.

The courts have also recognised that rank can be a tainted variable and failure to show no measurement bias present in this variable is likely to result in the defendant failing to carry the burden of proof, even though, the regression analysis which includes this variable, shows no inference of discrimination. On review of the above cited case law, the plaintiff tends to remove variables which constitutes the formal organisation, and is therefore likely to show, discrimination where none exists. This was the case in Fields and Walker versus Abbott Laboratories (2001), where the plaintiff did not include, among others job grade.

Without formal acceptance of comparable worth theory, or at least an acknowledgement of the issue, by the South African courts, this concern should be argued within the context of the particular case and based on the structures of the organisation and the merits of the job evaluation system.

2.5.5.9 Missing Data

A similar issue involves missing data. Harris and Suszko (2004) cautioned parties to this argument, noting that due to rapidly growing literature on this topic, the issue is very likely to arise again, as was in Morgan versus UPS (2000). When human resource records are incomplete, the complete removal of the individual (case) from the dataset may interfere with the statistical significance. Brown and Kros (2003) reviewed six approaches to dealing with this issue, four of which could be appropriate in the compensation context:

- Mean substitution: The researcher can use a measure of central tendency based on the available scores.
- Hot Deck imputation: The researcher can draw a measure from the most similar case available.

- Regression imputation: Regression analysis is used to predict missing values based on the variable's relationship to other variables in the data set.
- Multiple imputation : The researcher combines all the above into one procedure.

2.5.5.10 The Extrapolation Phenomenon

McCabe (1980) emphasised the problem of extrapolation where bias can still occur in the salary even though worth measurements are unbiased. In the situation where the distribution of the two groups differ on the worth variable, it is possible to fit the wrong model. Should the size of one group be much larger, the one group dominates the least squares fit.

In Figure 7 axis E represents experience, and S , salary. A linear regression line dominated by members of the less experienced plaintiff group would result in line U (broken line). A fit dominated by members of the non-plaintiff group, would result in line P (broken line). By extrapolating a linear model on sparse data (solid lines), both groups may appear underpaid depending on which line the question is considered. McCabe (1980) suggested Mahalanobis distance, to provide a measure of the multivariate distance between the two groups of variables. As an alternative to this, two separate regression lines may be calculated for each group, and the residuals for the other group examined to analyse between group differentials. Although McCabe (1980) described a simple scenario, it still possible that without proper examination of the residuals, an inappropriate model may be fitted onto the data.

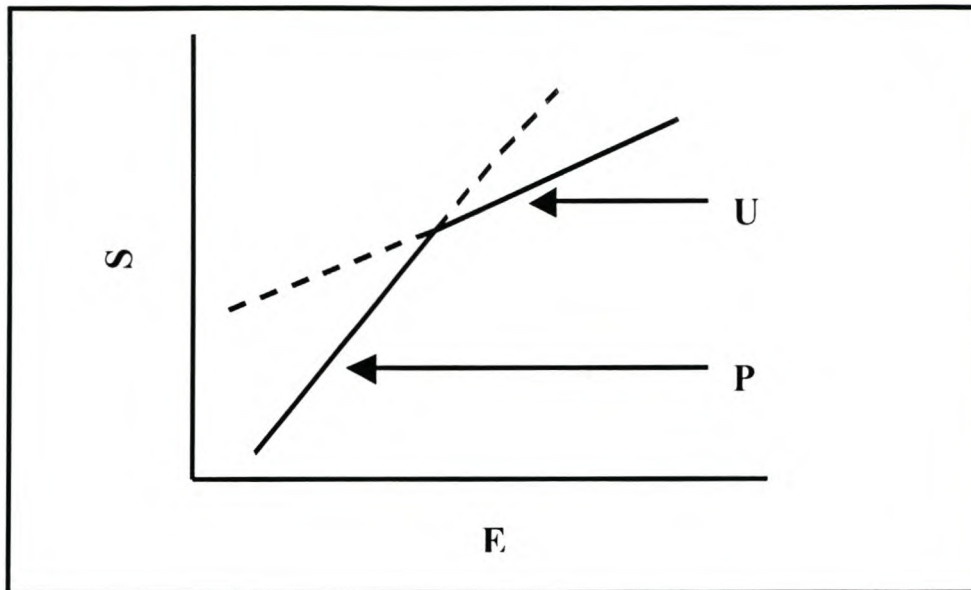


Figure 5: Estimated Regression for two groups (McCabe, 1980, p. 213).

2.5.5.11 Interaction Effects

Interactions effects involving group membership, according to the experience of Conway and Roberts (1983), are rare, but if they do occur and if they are large, they are nonetheless problematic because of their consequences. Large interaction effects can prevent a clear, unambiguous inference, as members of the same group might appear to both benefit and be disadvantaged by discrimination. In this scenario, a group and predictor interaction effect would mean that the slope of the regression of salary on X is different for the two groups. Although this need not necessarily be the case it could mean that the regression lines intersect each other in the observed range of X , thereby suggesting the over and underpayment for both groups.

2.5.5.12 Back Pay

Section 2.5.2.5 concerned the question of how the court and defendant should proceed to rectify discrimination. The following discussion involves the issue of reparation of damages. Should an employer be found guilty of discrimination, the court may order the employer to remunerate the plaintiff. Finkelstein (1980), described three approaches that were proposed by the courts when individual determinations cannot be made:

- *Pro rata*
- *Per capita*

- Flagging individual cases

In *United States versus United States Steel Corporation* (1975) a division of the total award was made *pro rata* to the loss of each victim while in *Head versus Timkin Roller Bearing Company* (1974), a division of the total award was made among the victims *per capita*. Unfortunately, these methods assume no relevant differences in qualifications among the victims. Finally, in *Sabala versus Western Gillette* (1975) and; *United States versus Wood, Wire and Metal Lathers Local Union 46* (1971), an award to each victim of the benefit was made according to the compensation received by a comparable member or members of the favoured class. This assumes that if no discrimination had taken place, the victims would have received all the promotional benefits that the favoured group members received. This is appropriate to remedy differences in pay for comparable work, but the assumption of equal promotion to a limited number of posts required investigation.

How the South African courts would handle the issue of back pay remains to be seen. The solution would lie in magnitude of unfair discrimination and the number of employees concerned. Within the South African collective bargaining system, the outcome would surely be based upon consultation with a trade union.

2.5.6 The Approach to Statistics in Litigation

Compensation litigation would benefit if judges would be cautious in setting precedent. Should litigants be set free to explore the boundless possibilities of statistics to further their case in wild abandon, the courts would lose important ground in the prohibition of illegal discrimination and equality in South Africa. Discrimination litigation under these circumstances would be determined by the budget allocated to the expert witness.

Although statistical debate and opinion should not remain the exclusive prerogative of academic journals, it should nonetheless not be allowed to immobilise litigation proceedings. Courts would best aspire to a controlled and cautious method of progression through a court case, not spend valuable time and money in circumspection of the nature of statistical evidence, but encourage the use of statistical evidence for the advancement of the case and in aid judgments. The courts must also heed the warnings and be sensitive to the issues encountered in foreign courts.

Many of the above issues involved the manner in which variables are chosen, defined and measured. As far as variables are submitted into evidence, the court must be alert to the following features of good evidence:

- The variables explain unique variance in compensation;
- the variables are considered to be legitimate on face value, and are business related;
- the measurements of job worth are shown to be reliable, valid and unbiased;
- there is evidence to show that the variables chosen form part of the compensation system;
- the variables were not chosen to fit the model, and explain away variance in compensation that would have, in absence of these variables, been accredited to group membership.

However, abiding by the above does not remedy the situation facing the court. In order to truly avoid a “rehash” of the American experience, the role in which statistics play in the case must also be managed. This thesis contends that the remaining issues could resolved by:

- Using statistical evidence to supplement an argument, and not the converse.
- Evaluation of the statistical model by the extent to which it mimics the actual compensation process. The shrewd choice of predictors and sample by the litigants could result in a model which serves the interest of their case, but only vaguely resembles the actual employment process.
- The court must re-examine the role of the expert witness, using the expert witness to testify to the extent which the regression model models the compensation process and the extent to which the underlying assumptions are met. The court must monitor the manner with which the expert is cross-examined.
- The adherence to best practice protocols.

Each of these points is discussed in the following sections respectively:

2.5.6.1 Statistics as Supplementary Evidence

When a statistical model assists in the investigation of the actual compensation system, it must be presented in support of a substantive theoretical argument either aimed at establishing a *prima facie* case of unfair compensation discrimination, or at establishing that a compensation system that at face value appears to discriminate unfairly, in fact does not. The role afforded to statistics in litigation should therefore be no different from its role in conventional research. There too it must testify for or against a specific theoretical position developed through logical argument in

response to a research-initiating question. In conventional research, the objective also should not be to find significant relations in the available data or to sniff out a well-fitting model from the myriad of possible models as an objective in itself. The statistics themselves should not usually be subject of dispute once the court has accepted the choice of variables. Litigants would place less importance on statistics, if statistics were afforded a more appropriate role in the presentation of an argument. Cases such as *International Brotherhood of Teamsters versus U.S.* (1977); *Hazelwood School District versus United States* (1977); *Craik versus Minnesota State University Board* (1894) and *Segar versus Smith*, (1984) must be avoided. In these cases, the litigants' arguments revolved solely on the outcome of the regression model.

One of the most telling quotes in this regard is the judge's summary in *Vuyanich versus Republic National Bank* (1980), as cited in Conway and Roberts (1984, p. 128):

Despite their recent recognition, the econometric techniques employed in this case are not discrimination C.A.T. scanners – ready to detect alien discrimination in corporate bodies. It may reveal shadows but its resolution is seldom more precise. Ultimately the findings of fact here are not numerical products and sums but human judgement that the facts found are more likely true than not true.

Due to of its limitations, statistical analysis can only provide a certain aspect of the compensation system. The meaning ascribed to the statistical analysis is only understood in context of the organisation. Statistical analysis invariably fails to capture less tangible elements of the organisation. With regards to its relationship with the burden of proof, nothing has changed since the seminal case of *Bazemore versus Friday* (1986) where the Supreme Court found:

... it is clear that a regression analysis that includes less than all measurable variables may serve to prove a plaintiff's case... . Whether, in fact, such a regression analysis does carry the ultimate burden will depend in a given case on the factual context of each case in light of all the evidence presented by both the plaintiff and the defendant... (cited in Ashenfelter & Oaxaca, 1987, p. 324).

As it is sometimes possible to manufacture or conceal illegal discrimination by tinkering with samples, choice and measurement of variables, statistical evidence cannot be allowed to meet the burden of proof in isolation. Statistical evidence is only useful to supplement or illustrate the main arguments of case. It is not recommended that the court bar the presentation of statistical evidence until the party has made a convincing argument, or similarly, has argued the case for presentation of statistics. Rather, it is suggested that the court consider statistical evidence as that which supports an argument, being wary of an argument, which seems contrived to meet the findings of regression analysis. The court would be well advised to ignore arguments which solely seek to elaborate upon or which depend upon the outcome of a regression analysis. The court nevertheless cannot expect the applicant to

produce supplementary/circumstantial/direct evidence, should the discrimination be impossible to demonstrate, save for relying totally on statistics.

The second issue concerns the concern discussed by Conway and Roberts (1983), Grogan (1996), Pinder (1998) and Landman (2000); and prescribed in the Chapter 2 of Promotion of Equality and Prevention of Unfair Discrimination Act (Republic of South Africa, 2000). Should the statistical model be viewed in isolation, a fundamental thread in the concept of fairness is ignored. Fairness is evaluated in terms of context and as such, failure to consider such elements as the organisational environment and the labour market (specifically external equity), organisational structure, strategy and culture, managerial goals and the nature of the compensation system, renders a statistical model bearing little meaning.

2.5.6.2 Causal Modelling

Dempster (in Conway & Roberts, 1983), argued that statistical inferences about discrimination must be based on causal underlying mechanisms that determine the differences in compensation observed across jobs and individuals. In a similar vane to that discussed above, the litigants should provide a clear stance on the nature and the logic of the process being evaluated. The identity of the variables that shape the compensation and the manner in which they influence compensation should be presented beforehand (and before the researcher embarks on developing the model). Debates on the conceptual model should precede debates about the statistical merits of the regression model.

Statistical analysis must be used to test hypotheses about the underlying causal processes. The inferences from the data must shed light on the truth of prior beliefs on the processes underlying the data. Structural equation modeling would assist in unambiguously explicating the variables that are meant to affect compensation and the manner in which they combine to determine remuneration. In this effort, labour economics is a key ingredient in building structural models of the employment process.

The type of employer behaviour, which results in certain outcomes, is central to the litigation. Causal models attempt to capture observed patterns and relationship among the variables in the data, and if successful would allow the observation of legitimate and possible discriminatory practices. The researcher must build those factors or assumptions about employer behaviour into the regression model

in order to isolate and investigate disparities, which could be routed in discrimination (Conway & Roberts, 1984).

Conway and Roberts (1984) echoed the sentiments of Blattenberger and Michelson (in Conway & Roberts, 1983): Should the organisation operate the compensation system according to the causal model, the casual model becomes an explicit application of the compensation formula itself. Unfortunately, as is mentioned in Conway and Roberts (1984), the task of isolating influences on the employment process by unions, employers, employees and the market place as well as the interactions thereof, is an extremely daunting and almost futile task due to the divergent views in how the processes operate.

Owing to the unfortunate fact that no one knows this actual mathematical wage equation, and most data sets tend to be unable to capture important variables, studies lack estimates of true wage discrimination. Therefore, omitted variables (which if present), which could legitimately explain differences in compensation, tend to increase the bias effect, resulting in an overestimation of the actual discrimination (Stanley & Jarrell, 1997). This calls for South African organisation to develop highly formalised compensation systems, which only determine compensation with variables, which are available for use in a regression study. Although as Stanley and Jarrell (1997) maintained, a regression model will not be able to capture all the subtle nuances of the labour market, such formalisation would clearly limit the overestimation of illegal discrimination.

It is important for the researcher to submit the best approximation of employer behaviour. The testimony of the organisation or plaintiff, whichever is relevant, should corroborate the circumstantial evidence. Evidence suggesting that the testimony, or observations of the actual employment situation have been altered to suit the behaviour described in model forwarding the case calls for scrutiny by the court.

Fisher (1986) pointed out that it is not often necessary to guess how the fully saturated model might appear, in cases where the researcher cannot model the decision processes of the firm. Should the details of job assignments and compensation allocation be vague, it may be more useful to suggest a model of worth. However there resides an element of danger in this, in that the focus will be wrongfully placed on the outcome of the analysis instead of on the arguments, which brought forth the analysis together with the manner in which the statistical model was developed. Fisher (1986, p. 279) stated:

Since it often is possible to fit the data well with models that do not reflect any structural characteristics of the phenomena being investigated, the danger here is that the laypersons involved will be impressed by poor work to the detriment of better models that do not fit or predict quite so well but are in fact informative about the phenomena being investigated.

Herein lies the important role of the individual who presents the evidence and the lawyer who cross-examines. In Section 2.5.5.4, specific mention was made to the manner in which evidence was cross-examined. It is necessary to narrow this argument, and discuss the role of the expert witness.

2.5.6.3 Expert Witness and Cross-examination

The presentation of the regression model requires that litigant describe the process by which the regression model was developed, the findings and statistical indices. Fisher (1986) outlined three areas where expert witnesses experienced problems:

- There is a communication gap between expert witness and the court;
- The witness is often subject to role conflict; and
- There is a clash between statistical and legal paradigms.

Witnesses typically struggle to explain the underlying methods and concepts of statistical analysis. The statistician is required to explain to the court what procedures have been performed, the rationale behind the methods and how the results presented should be interpreted. The required terminology is not always comprehensible to the jury. In South Africa, this problem may be circumvented by the basic training of judges. By keeping to a standard predetermined format, information can be communicated and understood by judges as the legal world might be cautious to accept any form of computation, which cannot be understood in elementary terms.

Secondly, there have been conflicts surrounding the statistician's role in accepting and criticising the opposition's statistics. The statistician is understandably caught between the role of ethical statistician and expert witness for an argument. For this reason it is more desirable for the parties to use a third party expert witness. Should a member of management or union be given this role, the court should be mindful of role conflict. The court could probably more easily encourage such an independent third party expert witness to cross-examine evidence more thoroughly.

It is important to make a distinction between legitimate criticism and intentions to cloud, confuse and complicate an argument either in defence or in cross-examination of evidence. When objecting to

evidence, the party must be able to demonstrate that the objection is firstly one which could in principle be made against any econometric study, and secondly, that the conclusion which the opposition makes is actually effected by the error being objected to. Should this not be the case, the use of statistical arguments during litigation is rendered useless.

Finally, there is a clash of paradigms between the statistician and examining lawyer. From the statistical paradigm, the best model is but an approximation. Statisticians view the process as reducing data to a few statistics, which become statistical fact (but do admit that statistics do not comprise absolute scientific fact). In effect, they believe that as long as the calculations are accurate, there is little room for question. The appropriateness of the statistic is, of course, open to debate (McCabe, 1980).

Lawyers may understand this principle, but they do not like it. Attorneys presented with a general argument, tend to think in terms of counter examples, and the fact that all observations do not lie on the regression plane may seem to them to provide ammunition for the opponent (Fisher, 1986, p. 278).

Herein lies a clash of paradigm, and possibly the largest obstacle for statistics in litigation. While an attorney would insist that the person performing the analyses should extract all possible models from the sample or population, so as not to be caught out on cross-examination, the statistician on the other hand, cannot simply mine the data until a pleasing model is rendered (Fisher 1986).

It is widely accepted that statistical evidence is not to be regarded as absolute, and that statistics is by nature an inexact science. Regardless and apart from this, it is not to be accepted as the only deciding evidence to satisfy the burden of proof, but in conjunction with testimony of actual compensation practises and intent, complimenting and modelling the case of the party, it serves as a critical ingredient of a successful argument.

A lawyer would have a statistician exhaust all the options and possibilities in favour of the case. An ethical statistician would have the statistical model be a true approximation of the actual employment process, regardless of conclusion. This is, as Fisher (1980) pointed out, important to the manner in which analyses are conducted, presented and cross-examined. Lawyers should rather lead questions to establish:

- how the expert witness proceeded with the study;
- how the expert decided upon the use of particular variables; and

- how many combinations were used rather than insisting that all possibilities were accounted for.

Should the model being presented have manifested early in the study, and variations tested were only tested later, it would stand in better stead than evidence, which only manifested subsequent to much computer analysis. The process with which the model was developed is as important as the substantive inferences derived from the model. It is suggested that a prudent court would regard these two aspects as being one and the same.

It would seem that the moment in which statistical evidence is entered into litigation, there should be a shift from attacking statistical vulnerabilities, toward an attack by offering a better model or approach (Fisher, 1980; Finkelstein, 1973). That is, a litigant should not be able to “shoot holes” in the opposing model, without suggesting an alternative.

It is also generally accepted that a reputable expert witness should remain objective to the cause regardless of who pays the service. Coulam and Feinberg (1986) investigated the possibility of a court appointed expert witness. The case study found that the court appointed expert:

- aided the judge to set priorities for managing resolution;
- provided authoritative judgments to resolve minor disputes with clear cut technical answers;
- clarified the implications of different arguments; and
- educated the judge about statistics, enabling the judge to evaluate with greater confidence.

Depending on the route statistical testimony takes in South Africa, this option seems to be well worth further investigation.

2.5.6.4 The Best Practice Protocols

Shortly before the Note (1975) appeared in the Harvard Law Review, Finkelstein (1973) published a general review of the use of regression models, suggesting four protocols to increase the utility of statistics during litigation. The protocols seem to have survived case law, and become part of how America dealt with the relevant issue discussed therein. The protocols are:

- A decision maker should specify data of such relevance and importance that he finds merits econometric analysis, and require that econometric presentations begin with that data and incorporate other data on a separate basis only when necessary for the purposes of accuracy and refinement (Finkelstein, 1973, p. 1461).
- A party objecting to an econometric model introduced by another party should demonstrate the numerical significance of his objections wherever possible and a party objecting to an econometric

model of data designed by the decision maker for econometric analysis should produce a superior alternative analysis of that data (Finkelstein, 1973, p. 1466)

- In any case which the decision maker makes significant use of the econometric findings, he should select the model that most fully describes the data and should make findings on the basis of that model (Finkelstein, 1973, p. 1471).
- A finding which rests in substantial part on data which has been analysed econometrically should be no more precise than the findings which the decision maker is prepared to make on the basis on econometric analysis (Finkelstein, 1973, p. 1474).

Hoffmann and Quade (1983, p. 140) summed up court decisions to that date that delineated the following, among others, as requirements for statistical evidence in the legal context:

- One must consider the qualifications [read worth] of the employees;
- One must consider the organizational situation;
- One must consider employee's preferences;
- One must consider the availability in terms of their ability to follow through on their interests and qualifications;
- One must consider labor agreements and rules of the organization;
- One must consider the history of a facility and how practices have changed over time;
- The act must generate long-lasting, gross or significant disparity; and
- The statistics must refer only to acts or processes that have occurred within a fixed time period.

Recently, Harris and Suszko (2004, p. 59) listed the following recommendations for Industrial Psychologists when presenting technical evidence in a case:

- Carefully consider challenges to your analyses and prepare explanations for why you have made those choices;
- If you have missing data, be prepared to cite supporting literature for the approach you take in analyzing the data;
- If there is evidence that performance ratings account for salary differences, and you wish to attack the pay systems, be ready to provide strong evidence that discrimination really has an effect on those ratings. Merely stating that discrimination affects performance ratings is not likely to be accepted by the courts; and
- Lumping all employees together across different divisions or geographical locations may not be sufficient in supporting class certification; separately analysing pay differences by division or unit may reveal that discrimination is not pervasive throughout an organisation.

Regression analysis is certainly a power tool in a litigant's arsenal. South Africa is in a fortunate position to have learned from the mistakes of previous cases and should be able to navigate the hazards it may present. Based on the research offered by this thesis, and already established American

protocols, a systematic process of presenting a regression analysis, which guards against exploitation is possible.

2.6 COMPENSATION DISCRIMINATION LITIGATION FRAMEWORK

“If life gives you lemons, make some kind of fruity juice.”

Conan O’Brien

As an extension of the before mentioned protocols, this thesis proposes a standard format as the best practice approach by which the court can navigate a compensation discrimination case. Again, the manner in which the court evaluates compensation discrimination evidence, determines the manner in which evidence is prepared, and ultimately the manner in which compensation systems are designed. That is, the compensation system should be operating in a manner, which furnishes evidence, which would be found favourable by a judge.

The following framework is nonetheless best applied in a general, flexible format, open to the specifics of the case, cognisant that a compensation system is business specific, and fairness is evaluated in terms of its organisational context (Grogan, 1996, Landman, 2000; Pinder, 1998). As judges are not usually accustomed to the active pursuit of each step requesting reason or evidence to support every argument, the framework should be used to highlight important points during the presentation of evidence. Litigants may also benefit from this framework, which plots out the likely course the litigation process would take.

For the sake of clarity, each of the issues is introduced separately. They are:

- the legal issues, that is, the type of case;
- the issues concerned with the nature of the compensation system;
- statistical evidence; and
- additional factors to consider in summary judgments.

References to the relevant sections of this thesis are indicated.

2.6.1 Legal Issues

The first set of issues deal with the legal nature of the case, being what the applicant intends to claim. The applicant attempts to lead *prima facie* evidence claiming unfair discrimination. As argued in this thesis, it is not wholly meaningful in the South African court to claim either disparate treatment or impact. Rather, the applicant could assist the judge by clarifying the allegation, referring to either direct or indirect discrimination (Sections 2.4.5.1 and 2.4.5.2). Should the applicant, not possess direct “smoking gun” evidence, statistical evidence alone should be sufficient to make a *prima facie* case of unfair discrimination. However, should the applicant attempt to model the compensation system by means of a multiple regression analysis, circumstantial evidence will be required in conjunction with the model. In this case, the applicant is essentially attempting to show disparate effect. It is unlikely that the court would expect the applicant to model the compensation system merely to establish a *prima facie* case, which begs the question as to what compensation differential would be large enough to warrant the court’s interest. The equivalent of the 80% rule in selection litigation might (but unlikely) be applicable here. Nonetheless, the applicant might eventually also be required to present an opposing statistical model, in order to better combat the defendant (Section 2.4.7.1).

Although this framework remains flexible on the issue of comparable worth, the court would also ascertain, whether the applicant intends to base evidence on jobs substantially equal or dissimilar jobs comparably equal (Section 2.3.4.1). The above steps are depicted in Figure 8.

The judge must also confirm that the applicant does not intend to pursue a claim of selection/promotion discrimination (Section 2.5.5.7.2). The assumption of selection/promotion fairness is required to investigate compensation fairness. As the latter is not required to investigate the former, the court must ignore compensation issues, until issues concerning selection/promotion have been settled. Fortunately, the assessment of selection/promotion fairness does not require compensation fairness as a prerequisite.

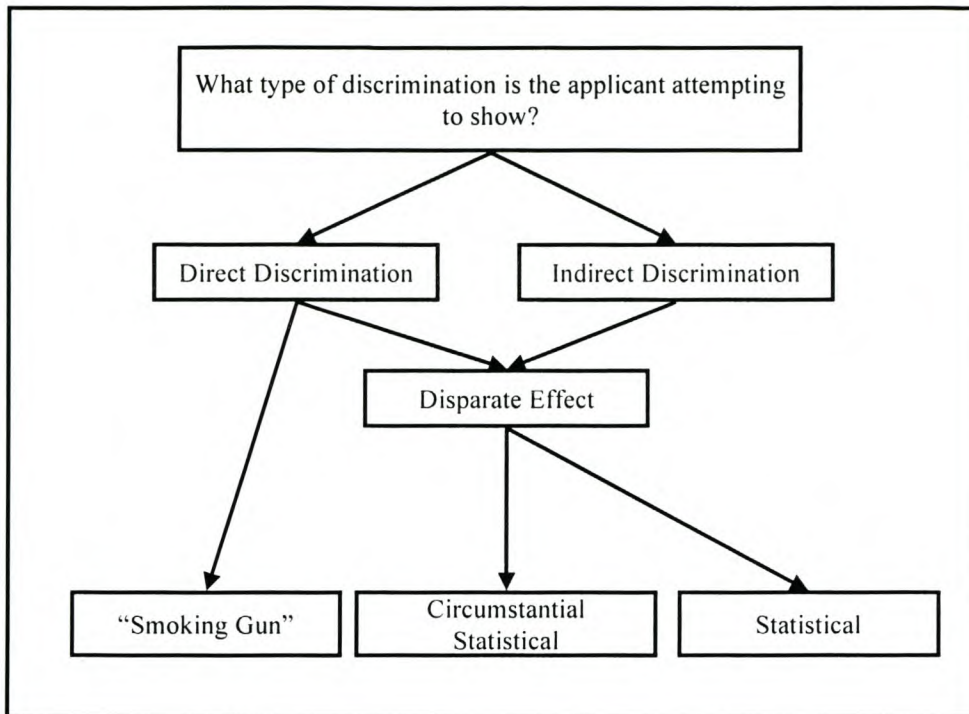


Figure 6: Legal Issues in the Framework

2.6.2 Compensation system issues

The second set of issues deal with the nature and context of the compensation in the organisation. Although the compensation system is to be treated as a comprehensive, unbroken system within the organisation, the court may refer to three main areas of scrutiny. They are:

- the variables selected as compensable;
- the manner in which the job and person (performance) worth variables are operationalised; and
- the management or operation of the compensation system.

2.6.2.1 Compensable Factors

The court must refer to both parties' position on the relevance of intrinsic rewards to the case. The inference of the statistical model could be affected by this position. At the outset of the presentation, the court must gain an insight into those factors which cannot be factored into quantitative evidence (Sections 2.5.5.2., & 2.5.5.3). The question should be raised as to the probability whether the inclusion of intrinsic rewards might change the statistical model's verdict on fairness. This refers to those

rewards, which are not taken into account by the market reading, and were not factored into the model (Section 2.1.2).

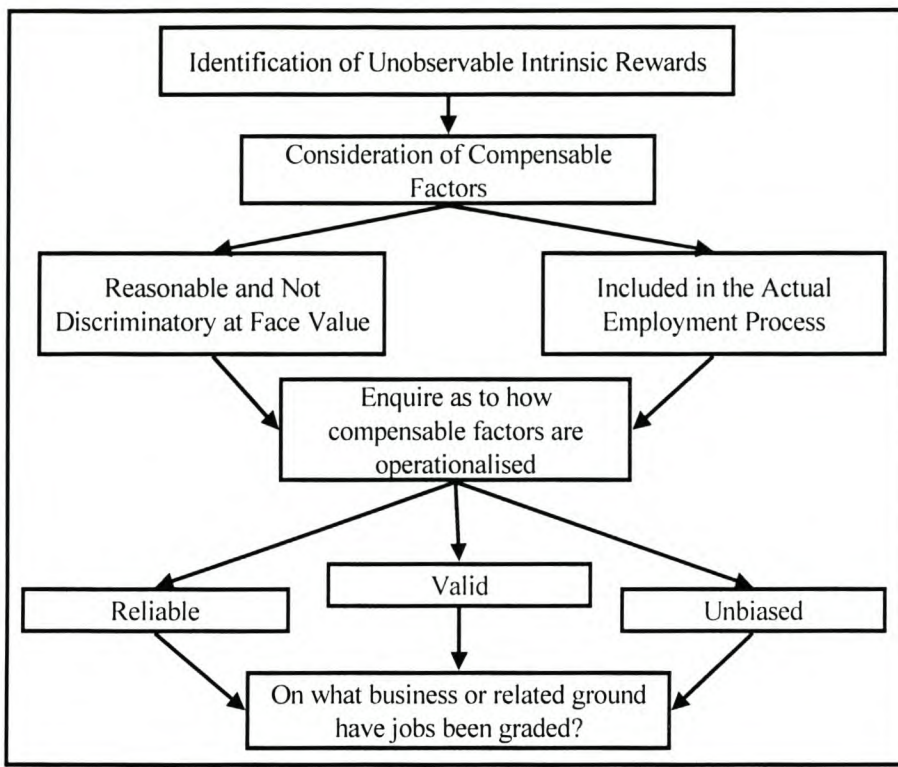


Figure 7: The Operationalisation of Compensable Factors

The selected worth factors should be reasonable and not indirectly discriminate against the applicant's subgroup on face value. Furthermore, as explained in Section 2.5.4.2.4, the careful selection of compensable factors may explain away or create group specific residuals. The party's case would therefore be furthered with evidence to show that the selected compensable factors are included in the actual employment process. These issues are illustrated in Figure 9.

2.6.2.2 Job Evaluation System

As discrimination can also be concealed in the manner in which compensable factors are operationalised, (Section 2.5.5.4), the court must evaluate the worth variables among others, job evaluation system, performance and tenure measures, in terms of reliability (Section 2.3.5.4.1), validity (Section 2.3.5.4.2) and bias (Section 2.3.5.4.3). This is particularly important for defendant to meet the burden, however arguably the same bar should be held for the applicant.

Once the court has gained insight into the development of the worth variables, careful consideration should be given to how the jobs are graded into levels (Section 2.3.5.2). These issues are illustrated in Figure 8.

The court must then ascertain whether discrimination exists within the labour market at face value. The applicant could at this stage advance arguments advocating this scenario. Labour market discrimination is discussed in Section 2.3.4.1.

2.6.2.3 The Compensation System

As a precursor to any form of statistical modelling, and in order to assess fairness, the defendant is obliged to describe the role of the compensation system in the organisation. The compensation system cannot be judged save for a proper description and explanation of the context in which the system functions. This is in order to make further distinctions between illegal discrimination and discrimination in light of business, economic, structural or similar requirements and provide a foundation for the development and evaluation of statistical evidence. Here, the defendant may refer to business goals and organisational constraints (Section 2.3.6). Should the original goals be shown to be impeded by factors outside of the organisation's control, an argument could be made for mitigating factors.

As shown in Figure 10, when evaluating mitigating factors, the court may also look to any initiatives taken on behalf of the employer to avoid unnecessary discrimination (Landman, 2000). Should indirect discrimination have been found, the court would be interested in whether the organisation attempted to find an alternative, which would have less differential impact. This may not be attributed to motive but rather as an investigation of an alternative method, which results in less illegal discrimination. This is important in determining whether the organisation has taken reasonable steps to avoid illegal discrimination.

2.6.3 Multiple Regression Analysis

The third set of issues concern the statistical model, which could be presented by either party. A central theme to this thesis is a shift in emphasis away from arguing over statistical technicalities, toward placing more importance on issues relating to the process by which the model is developed. It

is therefore advisable that the court gains clarity of these issues, before examining statistical indices. The context of the compensation establishes the manner in which the model should be developed which in turn establishes a context for the interpretation of the statistical model.

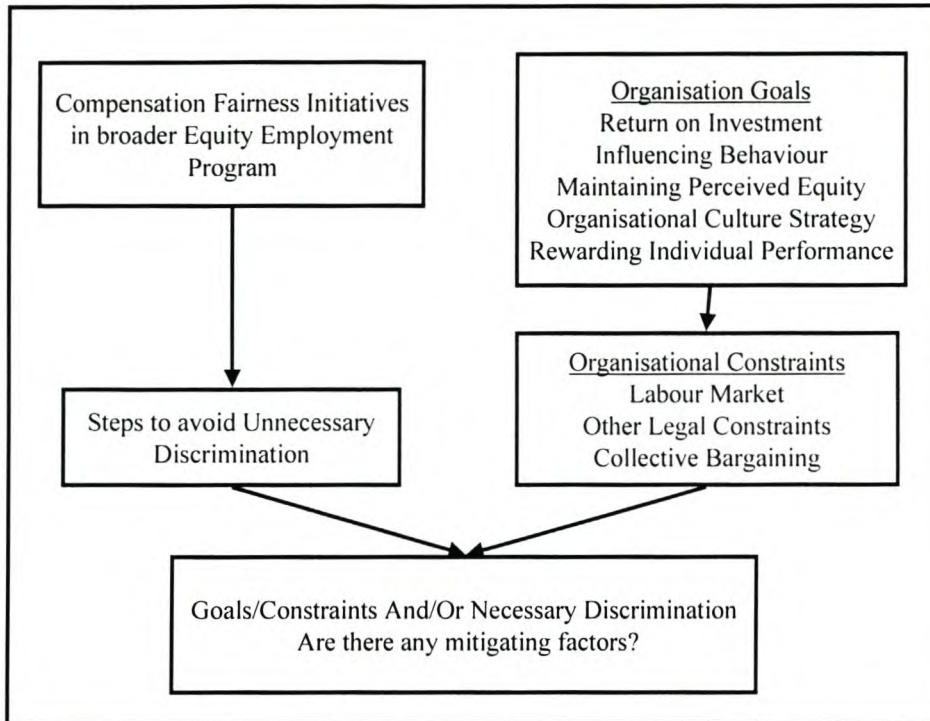


Figure 8: Contextual and Mitigating Factors

2.6.3.1 The Development of the Model

Although the type of issues, which would be raised, are business specific and follow on from the preceding arguments, there are three central common issues to which the court must pay heed.

Firstly, for reasons explained in Section 2.1.2, the court must determine whether the organisation operates in more than one labour or product market, and if so ascertain whether this could have bearing on the manner in which compensation level is determined in the actual employment process. This may lead the court to find favour in a model, which approximates the appropriate/actual compensation process. Jobs could be treated as being comparable or grouped into separate cohorts (Section 2.5.5.8).

Secondly, the court must learn how the model was developed. The process by which models are developed has been presented in Section 2.5.2.1. The question is whether the statistical model is an

accurate approximation of the actual employment process. By exploring the development of the model, the court can also look for signs that the model was deceitfully contrived to further the party's case.

Thirdly, the court must gather information on the underlying assumptions of the model, for example, whether qualitative variables have been operationalised to model the employment process and the absence of unobserved variables, discussed in Section 2.5.5.4. The above issues are illustrated in the framework in Figure 11.

2.6.3.2 Statistical issues

Only once the court is clear on issues of operationalisation, development and context of the model, should statistical issues be addressed. Should a litigant present evidence consisting of two group specific models while the other has used the dummy variable approach, it may be useful for the court to review the rationale behind the two differing approaches in relation to the case. The arguments regarding the two approaches are discussed in Section 2.5.2.3.

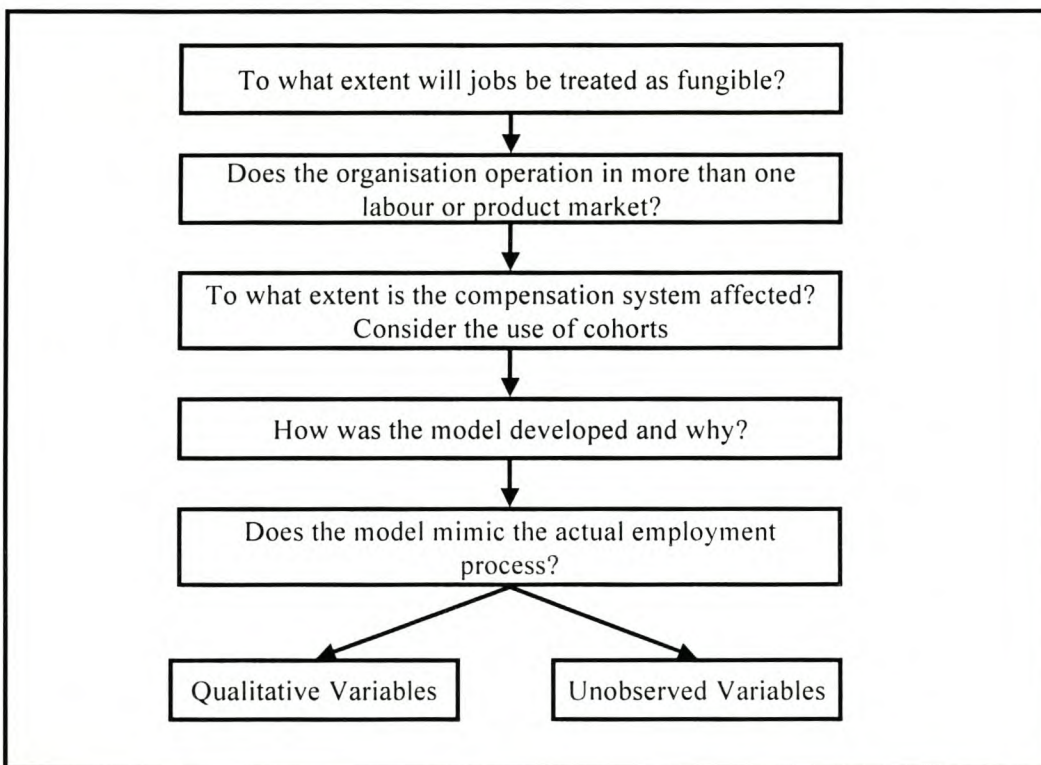


Figure 9: Development of the Model

The following issues refer to the sampling process:

- Should cases have been excluded from the model, reasons to the exclusion must be forwarded (Sections 2.5.5.6).
- The evidence must state whether the data set includes all employees in the organisation or a sample of the organisation (Section 2.5.2).
- The evidence must state whether the data been screened for outliers and what conclusion did the party reach with regards to specific outliers? (Section 2.5.4.1.6).
- The evidence must describe the nature of the dataset in terms of representation. Section 2.5.5.10 explains why the court may place more value on data in which the applicants subgroup is sufficiently represented.

The following statistical indices must be referred to: (Section 2.5.4.2)

- Significance of all partial regression coefficient associated with the legitimate factors that may determine compensation
- The standard error of estimate
- The co-efficient of determination
- The significant of R

The court must also examine the residuals, confirming whether the model has met the required assumptions of normality, independence of the disturbance term and homoscedacity, which are described in Section 2.5.4.1. Should the residuals indicate that the model has failed to meet the assumptions, the statistical evidence may well be discarded or devalued by the court, as the inferences may be inaccurate. These issues are building into the framework as per Figure 12.

2.6.4 The Summary Judgment

This framework does not prescribe a multiple hurdle approach with a specific order by which the court must approach the topics. Should this be the case, it would suggest that where evidence is found lacking in a particular aspect, the court must collapse the entire argument. Rather this framework emphasises that each argument establishes a context for all subsequent arguments. The summary judgments should therefore consider all the evidence together. There are few issues, which require the court to rule during the presentation of evidence. This allows the judge time to hear the entire argument before being required to intercede.

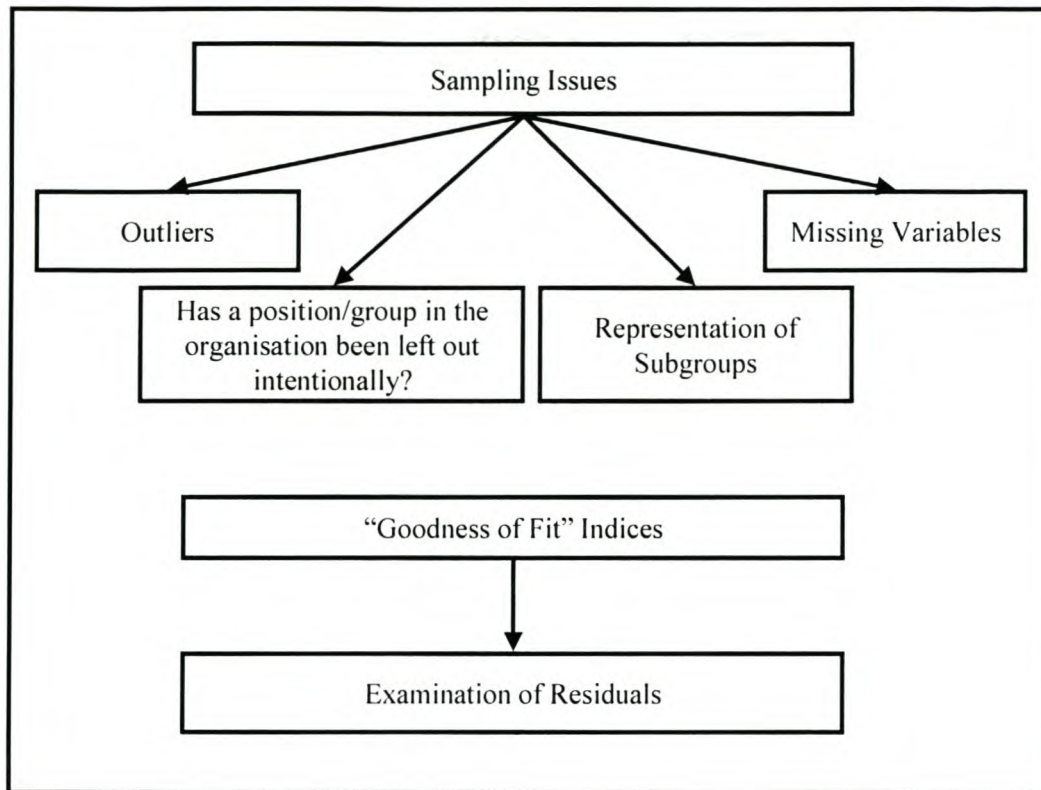


Figure 10: Statistical Issues

By considering a party's case in piecemeal fashion, representing by the shifting burden, would allow the party to conceal or exaggerate illegal discrimination. This does not mean that the court should follow the shifting burden as a matter of procedure. In terms of the compensation system, the combination of: the choice of compensable factors, operationalisation of compensable factors, manipulation of variables, exploitation of the job grading process, and the removal or exaggeration of intrinsic rewards could permit either party to alter the fairness inference, even though each step in the process appears above suspicion. This is also true of the development of the statistical model and its relation to statistical indices. It is possible to manipulate the development of the model to harvest desired indices.

The judge is able to avoid this manipulation by considering the evidence of each party in its totality, holding the parties to the context already established by their prior arguments, and when reasonable, requiring supplementary evidence to support their arguments (Section 2.5.6.1.) The court must also assess the effect illegal discrimination had upon the applicant group. Should pay adjustments and back pay be in order, the court should instruct the defendant to flag individual cases rather than adjust the regression line (Section 2.5.2.5 and 2.5.5.12).

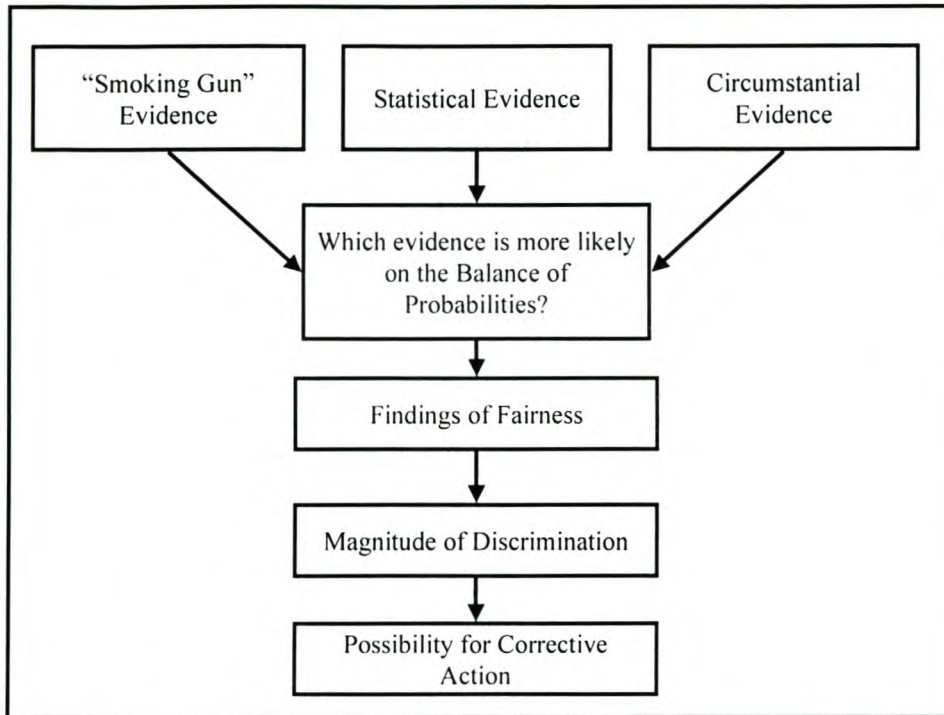


Figure 11: The Summary Judgment

As depicted by Figure 13, the judge must consider the credence of circumstantial evidence, in relation to the statistical model, to establish the most likely case (Sections 2.4.1). It is possible for the court to find in favour of the applicants model which maintain an inference of unfairness, while reserving judgments. In this case, the effect is significant, but too small to have any real impact in the actual employment process.

This thesis has focused on the removal of unfair discrimination, but it is important to draw attention to the larger context of inequity, namely, the wage gap. As mentioned earlier, without the removal of unfair discrimination from selection and compensation practices, the wage gap will continue to increase.

2.7 THE WAGE GAP: A MACROECONOMIC CONCERN

"What, no quote!"

Anonymous

Comparable worth/pay equity practices should not be viewed in isolation and appreciation should be given to economic environment in which such practices are debated. It is important to consider legislation attempting to rectify past imbalances of Apartheid policy through affirmative action

practices, as a separate topic to measures aimed at eliminating discrimination. Closing the wage gap is the affirmative action equivalent, in terms of readdressing past imbalances by way of compensation. Affirmation action as it pertains to the compensation system should, however, not be interpreted to refer to paying an individual of a previous disadvantaged group more for the same skills, knowledge and abilities but rather to actions to remedy the fundamental causes for group-related wage differentials. The removal of compensation discrimination fails to address the wage gap.

While Apartheid is arguably the historical cause of the wage gap, this thesis focuses upon the current influences currently hindering equitable pay practices albeit the current socio-economic manifestations of Apartheid.

To explore compensation fairness, it must be considered as independent from other efforts targeting employment equity and as such, this thesis is aimed exclusively at evidence to prove compensation equity devoid of allegations of selection/promotion unfairness. In order to attest to discrimination in the compensation system, equitable practices in the hiring process must be presumed. It is impossible to show that a job incumbent receives just reward for performance within a job where reward is not based on group membership, should the incumbent hold the job based on factors including group membership. Consequently it is possible to disguise pay inequity through employment inequity and for this reason, the court would be wise to ensure selection/promotion fairness, dealing and rectifying positions where necessary before attempting to discern pay equity.

The remnants of Apartheid left a racially segmented labour market and gross income inequality. Unemployment and poverty are the government's top priorities, as the income distribution is distressfully skewed (Bhorat *et al.*, 2001).

...the degree of inequality is striking. The poorest four deciles (40%) of households – equivalent to 52% of the population – account for less than 10% of total income, while the richest decile (10%) of households – equivalent to just 6% of the population – capture over 40% of the total income (cited in Bhorat *et al.*, 2001, p. 22).

The largest portion of the wage gap can be linked to differences in employee knowledge, skills and abilities and the ranging differences in the knowledge, skills and abilities required by the jobs. The former relates to societal issue that can only be remedied through training and development initiatives and the latter to the structure of the economy, and the general ratio of the highest paid in

organisations to the lowest paid (Bhorat *et al.*, 2001). The organisation must be blind to differences in skills, knowledge and abilities between groups, that is, the organisation should not allow itself to be influenced by the correlation between group membership and knowledge, skills and abilities when determining equitable compensation. This is a necessary evil in order to function in the market. Differences in skills, knowledge and abilities should nonetheless be addressed to addressed (as a related but separate problem) through the affirmative action policies of the Employment Equity Act (Republic of South Africa, 1998).

The wage gap is examined as the result of an amalgamation of factors, which to different extents contribute to the inconsistency of earnings among subgroups of society. It must also be noted that the adverse impact rendered by illegal compensation discrimination is not entirely the cause of the wage gap. As Wooden (1999a) pointed out, the value of the wage is also associated with other work conditions, such as allowance for leave, levels of physical comfort, danger and indirect benefits. Differences in work behaviours such as performance, absenteeism and length and nature of service over careers are also possible determinants of pay differences (Milkovich & Newman 1993; Veysey, 1985). The two main effects are difference in (supply side) preferences described by Hollenbeck, *et al.*, (1987) and the crowding hypothesis (demand side) advocated largely by England (1999), Mahoney (1983,) and Blumrosen (1979). The first supply side effects refer to the voluntary choice of particular groups to enter lower paying occupations⁴ while the demand side reflects the involuntary positioning of groups in particular lower paying levels and sections of the economy.

Much of the literature and research undertaken on wage discrimination (Blumrosen, 1979; England, 1999; Gunderson, 1994a; Lapidus & Figard, 1998; Lou, 1999; Orazem & Mattila, 1998; Sorensen, 2001; Wooden 1999a; Wooden, 1999b), emanates from the United States, Canada, Australia and to a lesser degree, the United Kingdom.

This literature on wage discrimination is not directly transposable on the South African context for two reasons: Firstly, where reference is made to male dominated and female dominated occupations, the South African context requires a consideration of a broader perspective, that is, the grounds upon which earnings gaps occur in South Africa and the comprehensive list of prohibited grounds. Secondly, it must also be taken into consideration that minority and majority groups have the reverse

⁴ Supply side preferences implies that the wage gap will never be eliminated as a small portion of the wage gap is hinged on demographic value systems. For example, a larger proportion of females seek the nurturing occupation of nursing.

denotation as, unlike the socio-economic state of countries where the literature originates, the previously the South African majority were disfavoured. Caution must therefore be exercised before applying empirical studies and conjecture to the local economy as foreign studies, particularly those referred to in this section will in many cases, render the antithesis when applied to post-Apartheid South Africa.

Grün (2004) affirmed that there have been few studies of discrimination in the South African labour market. After a detailed study of South African macroeconomic data, she found that (Grün, 2004, p. 19):

...in the second half of the 1990s labour market discrimination by gender was substantial. As discrimination can arise at different stages, it is necessary to get a detailed understanding of the barriers that exist in the labour market and how they affect particular groups of workers. But not only labour market legislation is in charge, also macroeconomic policy must address the need of the South African labour market by promoting growth which eventually will also stimulate the labour market.

In order to address the wage gap, society cannot blame organisations, placing blame on the failure to remove unfair discrimination from selection/promotion and compensation systems, but must address the broader issue. To this end, the ever increasing wage gap can only be curbed through education and training.

CHAPTER 3: CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

3.1 CONCLUSIONS

"If a man cannot make his point in ten minutes, he ought to be shot."

Robert Baden-Powell

Compensation is the metaphoric heart of capitalism and a fundamental cornerstone of any civilisation. Its connotations breach the hearts and minds of man. Compensation is fraught with the very complexities of the society, which it fuels. Issues surrounding fair compensation have traversed the ages having until relatively recently remained the dabbings of philosophers.

The value of labour is shaped by a myriad of vague and indefinable factors, which attempt to juggle the principles of justice and economic reality. Society, through its laws has charged organisations with the task of minding for the principle of fairness. Organisations have for this purpose, bred scores of job evaluations, salary surveys and performance appraisals. These measures must discriminate fairly, and for business or economic reasons. Upon dispute of unfair compensation, an assessment of fairness is not clear-cut as the issue of compensation involves the entire employment relationship and acts as part of a comprehensive management system. However, when judgment is sought, the court must attempt to evaluate each of the litigants' arguments in the context of the particular organisation in question.

For the sake of consistency, the court must work toward a blueprint against which the merits of each case may be judged. This thesis has advocated Cleary's model of fairness as a method to provide an objective and tangible approach to the evaluation of fairness. This model of fairness is favoured as it not only conceptualises fairness appropriately in terms of the Employment Equity legislation, but it provides a manner by which fairness can be administered and investigated by multiple regression analysis.

In the pursuit of fairness, comparable worth theory was presented not only as a second approach to fairness, that is, fairness among jobs, but as an implicit requisite assumption of multiple regression analysis. In order to investigate systematic discrimination, dissimilar jobs must be compared. It is

therefore a contradiction to consider multiple regression analysis while flouting comparable worth theory.

As is the case of similar legislations of America, Canada and the United Kingdom, South African legislation does not prescribe definite steps to demonstrate fairness. Foreign experience is welcomed to assist in determining the operational implications of clauses such as Section 27 of the Employment Equity Act (Republic of South Africa, 1998) and chapter three, subsection 14 of the Promotion of Equality and Prevention of Unfair discrimination Act (Republic of South Africa, 2000). Furthermore, foreign legislation provides suggestions by which compensation fairness could be interpreted, supported and implemented. The inclusion of similar terminology, albeit more strongly worded in South African legislations, would suggest that these issues will appear in due course.

The effects of employment equity practices upon the economy may improve the quality of labour and reduce the wage gap, however it is arguable whether South Africa could sustain the accompanying pressure on unemployment levels. Although comparable worth is widely regarded as an idealist's approach to compensation, presenting a minefield of challenges, the correct and cautious application of its principles however, seems to be, in suitable employment scenarios, an approach worthy of merit. The implications of comparable worth are set to impact greatly on Human Resource practices, as well as discrimination litigation. Comparable worth is certainly a serious issue for South Africa in light of socio-economic recovery from Apartheid, potential failure of affirmative action initiatives and the support of a strong constitution.

To conclude the argument for including comparable worth theory in compensation litigation, England (1992) provided three strong arguments for the application of comparable worth theory in legislation: Firstly, comparable worth theory is within the broad spirit of Title VII of the American Civil Rights Act (United States Congress, 1964). The animating principle of Title VII is the prohibition of group membership as a criterion in any employment decision, including compensation. The same spirit is found in the South African Employment Equity Act (Republic of South Africa of 1998) and the Promotion of Equality and Prevention of Unfair Discrimination Act (Republic of South Africa, 2000).

Secondly, statistical analysis is able to calculate the relative weights placed on compensable factors used to determine actual compensation. The use of mechanical means to determine calculation as opposed to priori evaluations allows statistical analysis to capture the employer's actual policy.

Statistical analysis is suited to capture systematic deviations between pay lines and determine whether group membership can account for these deviations.

Thirdly,

... by advocating policy-capturing job evaluations to meet the plaintiff's burden of proof, avoids the criticisms that the jobs do not have an intrinsic worth outside the market, and that comparable worth is trying to mandate payment according to some mythical intrinsic worth. Policy-capturing job evaluation does not evaluate the intrinsic worth of jobs. It simply reveals what standards of evaluation are implicit in the employer's own pay system. There is thus no requirement that employers follow any particular formula in translating job characteristics into pay (England, 1992, p. 246).

It remains to be seen however, whether South African legislation will be interpreted as requiring comparable worth practices and whether comparable worth would be enforced directly by the courts, as much room has been left for interpretation. Faced by similar societal factors, similar legislation and a pressing cause to rectify an ever increasing wage gap, it is conceivable that South African unions will follow suite, encouraging comparable worth. Furthermore, is it likely that the unions may initially parry the litigation route, (fearing the court would rule against comparable worth policy,) and establish comparable worth policy through collective bargaining, indirectly holding organisations legally accountable through collective agreement.

Returning to the use of multiple regression analysis, there are a number of arguments supporting its use in South Africa. Moreover, the movement away from human capital models, the stationary burden of proof, smaller organisations, and the emphasis on effect based discrimination, are reasons to believe that the technique will find more success in South Africa. These arguments are reviewed:

Firstly, much of the case law and literature arose during the 1970s and 1980s when human capital models were prominent in personnel management, specifically in matters of selection and compensation. Here, academic qualifications were the dominant proxy measurement for value of an employee, where employees were directly compensated for academic qualification. This approach has been replaced with new modes of thought (Carrel *et al.*, 1998; Gerber *et al.*, 1998), as modern human resource management places more emphasis on a broader, performance-orientated approach. Under the new South African legislation, with emphasis on transparency and collective bargaining, there is a movement toward more mechanical models of compensation, in which variables measuring worth are clearly defined and formally applied. The variables used are often established in the organisation, and self-evident. The South African courts may likely mistrust the submission of unfamiliar variables as

those cited by Seberhagan such as veteran status and occupational prestige (in Barrett *et al.*, 1986). In contrast to twenty to thirty years ago, variables deemed inconsequential or chosen to fit the model to allege illegal discrimination where none exists, or defend illegal discrimination would stand scrutiny that is more arduous.

Secondly, as Judge Higgenbotham's "minuet-thermonuclear battle" statement vehemently contended, the American courts did battle to deal with statistical evidence in a shifting burden framework (Norris, 1987, p. 68). It is possible that the stationary burden will prove more appropriate to statistical evidence. It is unclear what role Judge Landman's verdict would play and whether it is restricted to the now obsolete schedule 7 of the Labour Relations Act (Republic of South Africa, 1995). The use of 80% rule of selection discrimination may herald a return to the shifting burden model.

Thirdly, much of the American precedent involving large parastatal organisations stumbled on issues of sampling. The relatively smaller size of South African organisations will assist in data collection. In smaller organisations, sampling is not required. Sampling disputes are therefore removed and it may be easier task to reduce the compensation equation to a mathematical approximate.

Fourthly, multiple regression analysis is more suited to the South African legal system because the parties need not show motive. Statistical analysis is only concerned with the effect of the compensation practices and not how parties might feel on the issue or whether management conspired to instigate such effects. This has been judged the intent of legislation. In terms of jurisprudence, it is unlikely South African courts will be conservative in their reception of the arguments presented by comparable worth and multiple regression analysis. Should the juncture case comparable worth theory, namely Spaulding versus University of Washington (1984), have taken place in South Africa, issue of motive would not have played a role – the outcome would be based on effect, and the decision may have been different.

Despite reservations, multiple regression analysis is still used in America as the best method to deal with compensation discrimination (Ashraf in Loucopoulos, Pavur & Gutierrez, 2002; Harris & Suszko, 2004). The above arguments spur an optimistic perspective on the future use of regression models in South African compensation discrimination litigation.

A question mark remains concerning the role of the distinction between disparate treatment and impact. The thesis, while not doubting the meaning and relevance of direct and indirect discrimination,

has argued in favour of “disparate effect” a broader doctrine by which compensation discrimination can be demonstrated under South African legislation.

The following are indicative for future South African cases:

- The South African courts are open to foreign precedent in this field (Landman, 2000).
- Courts will be hesitant to second-guess employers job evaluation systems, but this is not to say that they are not extremely vulnerable to criticism (England, 1992).

This thesis does beg the answers to the following questions:

- How does the legislature view the free market system? There are many arguments attempting to describe how the labour market operates together with suggestions how and why it should be regulated. As the legislation seems solely concerned with internal equity, is there room for an organisation to manage external equity thereby compromising somewhat on internal equity? Social scientific evidence suggests that market wages perpetuate discrimination. The defense’s claim therefore is “everybody else is doing it” and as such legislation is helpless against what social science has found to be the main cause of discrimination (England, 1995). The organisation is limited to market practices, and how the market pays – and as such limited to operate illegally. What role does market policy play?
- As the operation of the compensation system and the strongest evidence required to vindicate it, is one and the same, what are the expectations of the South African courts for organisations coming to terms with the new legislation? That is, how can an organisation reasonable be expected to leap an invisible hurdle? The Supreme Court of the United States has not yet established a universal standard of review (Norris, 1987). Owing to the fact that experienced legal systems have failed to deliver a resolute answer to this question, could South African courts be expected to skirt the issues?

Conway and Roberts (1984) wrote that there are no simple answers to questions on which there is little consensus. What remains is the fact that human resource interventions require supporting evidence. The American courts have recognised the utility derived from statistical analyses but were cautious in accepting their full implications. South African judges will inevitably concur with their American counterparts and academia would be giving the legal field and management, a powerful tool to aid in conflict resolution. At this, stage it stands, despite its necessary evils as the technique most suited to issues of compensation discrimination.

This development of multiple regression analysis has proceeded through a slow accretion of decisions that have placed more and more reliance on econometric methods in determination of whether there is evidence of discrimination. The methods now presented to the courts look remarkably similar to the kind of studies that once appeared in the journals (Ashenfelter & Oaxaca, 1987, p. 322).

Regression analysis is supported by this thesis, due to its compelling logic and credible arguments. It is however susceptible to manipulations and is delivered with by academics with an accompanying disclaimer. Fortunately, should the South African courts be aware of its vulnerabilities, they will be able to detect deceit.

It remains to be seen whether the South African courts will accept multiple regression analysis with the mixture of enthusiasm and caution, which it deserves. In the same vane, it remains to be seen where the Human Resource profession practitioner can use this tool to good effect, in the spirit of good corporate governance and to avoid temptation. It is hoped that these pages are a step toward this.

3.2 LIMITATIONS

The following limitations were noted:

- While this thesis explored case law and associated legal concepts, it exists for application in a management context, and does not profess to be a legal reference.
- A potential shortfall of a study such as this lies in the nature of salary surveys and the role of discrimination in the labour market. There is little evidence at this stage to evaluate the possible discriminatory effect of South African salary surveys and their use.
- This thesis has been built on a scant South African case law. As case law appears, much of the speculation could be removed, and absolute answers delivered.
- The approach advocated by this is general and is not case/organisation specific. The aim of the thesis is to prescribe an approach but cannot manufacture specific responses to specific business issues.
-

3.3 SUGGESTIONS FOR FURTHER RESEARCH

The following suggestions for further research can be made:

- As mentioned above, this thesis is not intended to be a legal work but rather an attempt to outline an approach for the human resource professionals to this legislation in areas

where the legal profession is ill equipped. Collaboration between these two fields is required to build a sturdier bridge as a platform for further debate.

- A regular examination of cases documenting the courts' construction of the standard of required proof will be afford courts and management a reference in which base their work. As South African case law develops, a review similar to Barrett and Sansonetti (1988) and Barrett *et al.*, (1986) will be greatly valued, pointing out the aspects of evidence in which litigants are finding success and failure.
- Barrett *et al.*, (1986) held that a follow-up analysis as to ascertain whether the regression approach accurately predicts perceived discrimination is rarely done. Little research exists to implicitly distinguish between discrimination and perceived discrimination. It would be worthwhile to follow a regression study with a survey measuring perceived discrimination, not for the purposes of litigation, but to aid management in decision-making. In the interests of motivation an organisation would be fortunate should perceived discrimination and actual discrimination coincide.
- The question must be raised as to the possible role of a court adviser who may assist the judge in matters of statistics. Court advisers, may aid the judge in clarifying arguments, assisting with communication in the courtroom, sifting out irrelevant points, and support the judge in making a decision.
- The anticipated effect of fair compensation practices upon the economy, are based on international experience. The minority/majority principle is reversed in the South African economy. Local research into the effects is required as it is unclear where the conclusions will hold true.
- There remain important statistical issues with regard to the modeling of firstly, stepped job grades, and secondly, a curvilinear pay curve. The literature is silent on this issue which may have grave consequences on the accuracy of multiple regression analysis in the compensation context.

Addendum: SPSS Examples

"Computers are useless. They can only give you answers."

Pablo Picasso

This addendum comprises of two examples, which illustrate regression analyses showing fairness and unfairness respectively. The datasets were manipulated to illustrate the two scenarios. SPSS was used to generate the output presented using fictitious datasets. Both datasets include three hundred cases consisting of two population groups, namely, gender and race. The computer output includes summary notes highlighting key points of the analysis.

This example demonstrates that although the two groups are differently distributed on job worth, it is not evidence of unfairness (although it signifies a wage gap). This methodology would be used by the defendant in the rebuttal of a prima facie case of discrimination. (Similarly, unfairness could exist, where no significant difference is recorded, when differences in actual job worth are not reflected). This example assumes a process preceding this one in which the compensation system is explicated, the legitimate factors taken into account by the system operationalised and compensation is regressed on a weighted linear composite of the legitimate determinants. The performance worth score (jobeval) is may also be interpreted as a weighted composite of those predictors significantly explaining variance in salary in the initial regression model as described in section 2.5.2.

The SPSS syntax shows how the data is generated, and then analysed:

A normally distributed salary variable was created with mean 10000 and standard deviation of 500. Performance was subsequently derived as a linear function of performance worth. A random error variable was created with mean zero and standard deviation of eight. This was linearly combined the existing salary to lower the salary-performance worth correlation from perfect unity to an approximately realistic figure. A regression coefficient (slope) for the relationship between the performance worth score and salary was calculated. A separate file was used, in which scores and salaries for one group were increased using the previously calculated relationship. This allowed for different distributions between the two groups, while keeping the same relationship (maintaining fairness). During the generation of the used for the illustration of the alternative scenario of unfairness, the performance worth scores were increased disproportionately. The data was then

analysed. Descriptive statistics were also calculated before running the tests described in section 2.5.2.4.

4.1 FAIRNESS

Syntax

*a fairly fair compensation scenario.

```
COMPUTE case=$casenum .
EXECUTE .
COMPUTE Salary = RV.NORMAL(10000,500) .
EXECUTE .
COMPUTE jobeval = 0.02*salary .
EXECUTE .
COMPUTE error1 = RV.NORMAL(0,8) .
EXECUTE .
COMPUTE jobeval = jobeval+error1 .
EXECUTE .
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT salary
  /METHOD=ENTER jobeval .
```

```
COMPUTE GROUP = 1 .
EXECUTE .
COMPUTE SALARY = SALARY+2000 .
EXECUTE .
COMPUTE JOBEVAL = JOBEVAL+62.11180124.
EXECUTE .
```

```
COMPUTE GROUP = 0 .
EXECUTE .
```

```
ADD FILES /FILE=*
  /FILE='E:\SPSS\RYAN DATA_1.sav'.
EXECUTE .
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT salary
  /METHOD=ENTER jobeval .
GRAPH
  /SCATTERPLOT(BIVAR)=jobeval WITH salary BY group
  /MISSING=LISTWISE .
FREQUENCIES
  VARIABLES=salary jobeval /FORMAT=NOTABLE
  /STATISTICS=STDDEV VARIANCE RANGE MINIMUM MAXIMUM MEAN MEDIAN MODE SKEWNESS
  SESKEW KURTOSIS SEKURT
  /ORDER= ANALYSIS .
SORT CASES BY group .
SPLIT FILE
  LAYERED BY group .
FREQUENCIES
```



```

VARIABLES=salary jobeval /FORMAT=NOTABLE
/STATISTICS=STDDEV VARIANCE RANGE MINIMUM MAXIMUM MEAN MEDIAN MODE SKEWNESS
SESKEW KURTOSIS SEKURT
/ORDER= ANALYSIS .
REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT salary
/METHOD=ENTER jobeval
/SAVE RESID .
SPLIT FILE
OFF.
REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT salary
/METHOD=ENTER jobeval
/SAVE RESID .
GRAPH
/SCATTERPLOT(BIVAR)=jobeval WITH res_1 BY group
/MISSING=LISTWISE .
ONEWAY
res_1 BY group
/STATISTICS DESCRIPTIVES
/MISSING ANALYSIS .
COMPUTE Interact = group*jobeval .
EXECUTE .
UNIANOVA
salary WITH jobeval
/METHOD = SSTYPE(3)
/INTERCEPT = INCLUDE
/CRITERIA = ALPHA(.05)
/DESIGN = jobeval .
UNIANOVA
salary WITH jobeval group interact
/METHOD = SSTYPE(3)
/INTERCEPT = INCLUDE
/CRITERIA = ALPHA(.05)
/DESIGN = jobeval group interact .

```

Example of Step 1:

To examine compensation fairness, salary needs to be regressed on a weighted linear combination of all compensable factors that had been (allegedly) allowed to influence performance worth. In this illustrative case the simplifying assumption was made that job worth is the only performance worth variable that determines compensation. A plot of salary against the job evaluation score in Figure 12 reveals a linear relationship between the two variables. Differences in the marginal salary and job evaluation distributions are reflected in the manner in which the observations of the two groups project on the X and Y axes.

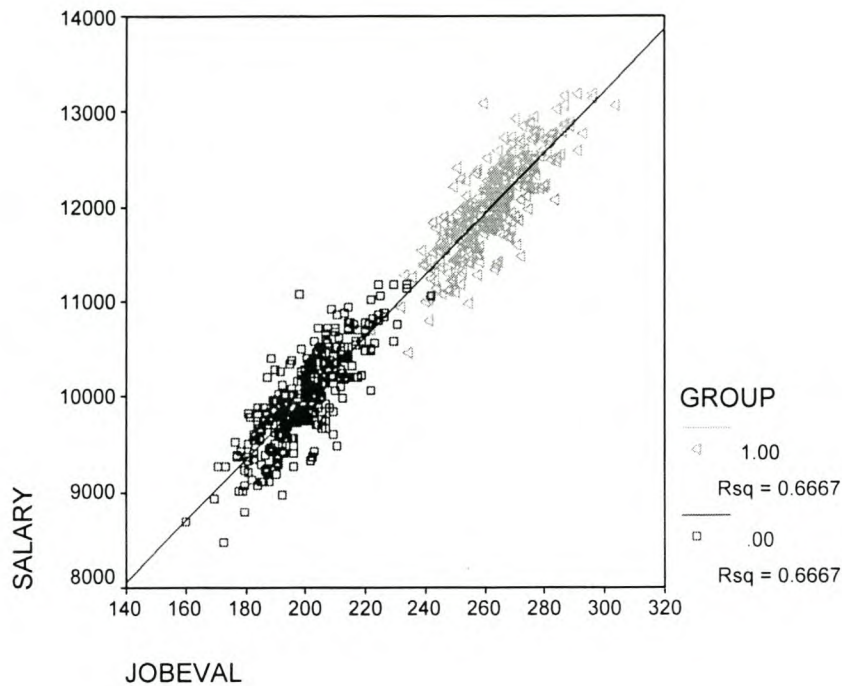


Figure 12: Plot of salary against measure of job worth (alluding to fairness)

The regression of salary on job evaluation is given in Table 4. Job evaluation ratings significantly ($p < 0,05$) account for differences in compensation level. Moreover, a high proportion of the variance in salary (0,933) can be explained in terms of differences in job evaluation ratings. The question, nonetheless remains whether group membership significantly explains variance in salary that is not explained by differences job evaluation ratings. The latter qualification is important since Figure 12 clearly shows that differences in salary are related to group membership. That group membership would significantly explains variance in salary that is not explained by differences job evaluation ratings seems unlikely since it appears from Figure 12 as if the regression of salary on job worth coincides for the two groups.

Table 4: Regression of salary on the job evaluation score

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	JOBEVAL ^b	.	Enter

a. All requested variables entered.

b. Dependent Variable: SALARY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.966 ^a	.933	.933	288.93125

a. Predictors: (Constant), JOBEVAL

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.00E+08	1	699871331.8	8383.574	.000 ^a
	Residual	49921797	598	83481.266		
	Total	7.50E+08	599			

a. Predictors: (Constant), JOBEVAL

b. Dependent Variable: SALARY

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3557.730	82.194		43.284	.000
	JOBEVAL	32.200	.352	.966	91.562	.000

a. Dependent Variable: SALARY

To determine whether group membership explains additional variance in salary not explained by job worth, the (unstandardized) salary residuals ($Y - E[Y|X]$) were calculated from the regression of salary on job worth. These unstandardized residuals were subsequently plotted against job worth as shown in Figure 13.

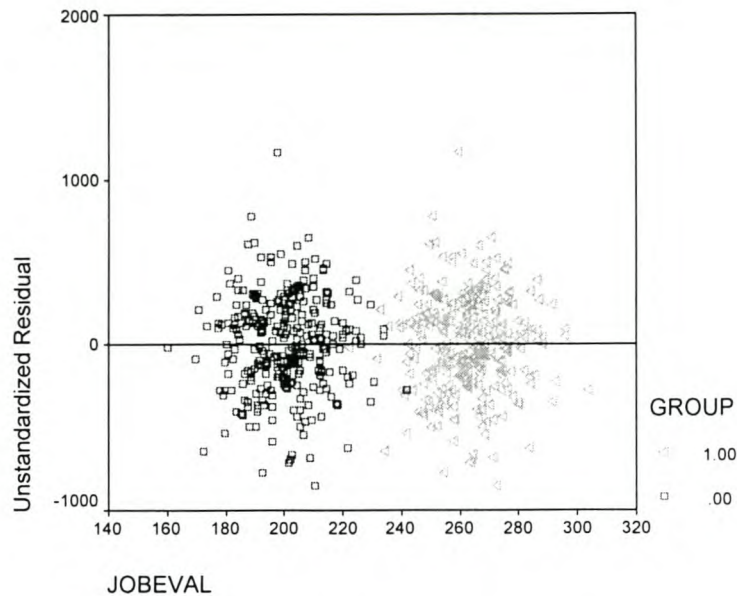


Figure 13: Plot of unstandardised residuals against job evaluation rating

Figure 13 suggests that the salary residual distributions of the two groups coincide. It therefore appears as if there are no systematic differences in compensation that cannot be accounted for in terms of differences in job worth but that can be accounted for in terms of differences in group membership. This would in turn suggest that compensation is fair.

Example of Step 2

To evaluate the qualitative inference made from Figure 13 somewhat more formally the mean unstandardized salary residuals were calculated (Table 5). The significance of the difference in these mean residuals was tested through a oneway analysis of variance (ANOVA). The results of the ANOVA are shown in Table 5. This analysis shows that the differences in the mean residuals are not significant [$p > 0,05$]. It therefore corroborates the inference derived from Figure 13 that group does not explain variance in salary not explained by the job evaluation score. This is a somewhat extreme case where the regression equations of the two groups coincide perfectly and the mean unstandardized salary residuals are therefore the same due to the artificial nature of the data.

Table 5: ANOVA comparing Between-Group Residual Means

Descriptives

Unstandardized Residual									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
.00	300	-.0008202	288.93124782	16.68145	-32.8287472	32.8271068	-847.418	1165.671	
1.00	300	.0008202	288.93124782	16.68145	-32.8271068	32.8287472	-847.416	1165.672	
Total	600	.0000000	288.68996908	11.78572	-23.1463529	23.1463529	-847.418	1165.672	

ANOVA

Unstandardized Residual					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.000	1	.000	.000	1.000
Within Groups	49921797	598	83481.266		
Total	49921797	599			

Example of Step 3

The foregoing conclusion could be verified by formally testing whether group membership significantly explains variance in salary when added to a model already containing job worth as a main effect and/or in interaction with the job evaluation variable. The moderated regression approach, however, assumes equal error variances across groups. H_{01} , shown below, consequently needs to be tested:

The first null hypothesis is tested as:

$$H_{01} : \sigma^2[Y | X; \Pi_1] = \sigma^2[Y | X; \Pi_2]$$

$$H_{a1} : \sigma^2[Y | X; \Pi_1] \neq \sigma^2[Y | X; \Pi_2]$$

A simple linear regression of salary on job worth, split by group (see Table 6), renders the requisite statistics. The mean square error of each group against its own regression line are compared to detect for differing distributions

Table 6: Simple Linear Regression by group

Variables Entered/Removed ^b				
GROUP	Model	Variables Entered	Variables Removed	Method
.00	1	JOBEVAL ^a	.	Enter
1.00	1	JOBEVAL ^a	.	Enter

a. All requested variables entered.

b. Dependent Variable: SALARY

Model Summary^b

GROUP	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
.00	1	.817 ^a	.667	.666	289.41563
1.00	1	.817 ^a	.667	.666	289.41563

a. Predictors: (Constant), JOBEVAL

b. Dependent Variable: SALARY

ANOVA^b

GROUP	Model		Sum of Squares	df	Mean Square	F	Sig.
.00	1	Regression	49935666	1	49935665.89	596.166	.000 ^a
		Residual	24960899	298	83761.404		
		Total	74896564	299			
1.00	1	Regression	49935666	1	49935665.89	596.166	.000 ^a
		Residual	24960899	298	83761.404		
		Total	74896564	299			

a. Predictors: (Constant), JOBEVAL

b. Dependent Variable: SALARY

Coefficients^a

GROUP	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
.00	1	(Constant)	3557.761	264.608		13.445	.000
		JOBEVAL	32.200	1.319	.817	24.417	.000
1.00	1	(Constant)	3557.772	346.395		10.271	.000
		JOBEVAL	32.200	1.319	.817	24.417	.000

a. Dependent Variable: SALARY

The F-ratio is calculated as the ratio of the mean square errors, (largest over smallest). Using Table 6, F is found to be 1, which falls to the left of F-critical ($F_c(298;298) \approx 1$). The first null hypothesis thus cannot be rejected [$p > 0.05$] and equal error variances can be assumed.

The resultant equations (Table 6) suggest two identical linear pay lines, which may be expressed as $E(Y | X; \pi_0) = 32.2(x) + 3557.761$ (for the black group) and $E(Y | X; \pi_1) = 32.2(x) + 3557.772$ (for the white group) whereby job evaluation may be substituted to estimate appropriate compensation. The question remains whether these lines differ significantly [$p < 0,05$]. Again it is readily apparent that they do not (due to manner in which the data had been created) but nonetheless the requisite analyses will be performed to formally demonstrate this.

Example of Step 4

The full-saturated model, shown before as equation 8, may be fitted on the data to test H_{02} .

$$H_{02} : \beta_2 = \beta_3 = 0 \mid \beta_1 \neq 0$$

$$H_{a2} : \beta_2 \neq \beta_3 \neq 0 \mid \beta_1 \neq 0$$

Table 7: Linear regression of salary on job worth

Tests of Between-Subjects Effects

Dependent Variable: SALARY

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	699871332 ^a	1	699871331.8	8383.574	.000
Intercept	156406017	1	156406017.4	1873.546	.000
JOBEVAL	699871332	1	699871331.8	8383.574	.000
Error	49921797.0	598	83481.266		
Total	7.342E+10	600			
Corrected Total	749793129	599			

a. R Squared = .933 (Adjusted R Squared = .933)

Table 8: Moderated linear regression of salary on job evaluation, group and job evaluation * group interaction

Tests of Between-Subjects Effects

Dependent Variable: SALARY

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	699871332 ^a	3	233290443.9	2785.178	.000
Intercept	15142248.5	1	15142248.48	180.778	.000
JOBEVAL	49935665.9	1	49935665.89	596.166	.000
GROUP	5.826E-05	1	5.826E-05	.000	1.000
INTERACT	.000	1	.000	.000	1.000
Error	49921797.0	596	83761.404		
Total	7.342E+10	600			
Corrected Total	749793129	599			

a. R Squared = .933 (Adjusted R Squared = .933)

$$H_{02} : \beta_2 = \beta_3 = 0 \mid \beta_1 \neq 0$$

$$H_{a2} : \beta_2 \neq \beta_3 \neq 0 \mid \beta_1 \neq 0$$

H_{02} is tested by calculating $F = \{(SSR[b_1, b_2, b_3] - SSR[b_1]) / [p - 1]\} / MSE[b_1, b_2, b_3]$

where $F \sim F[p-1, n-p-1]$ and p represents the number of effects in the saturated model (in this example, $p=3$). Using tables 7 and 8, F is calculated as $0 [(699871332-699871332)/2]/83761.404$, which falls left of F -critical ($F_{c(2;596)} \approx 3,02$). Therefore H_{02} cannot be rejected. It is now possible to conclude that the regression equation of groups π_1 and π_2 are equal in slope and intercept, that group does not explain variance in salary not explained by differences in job evaluation ratings, and thus that the compensation system is fair.

4.2 UNFAIRNESS

Should the case be that H_{02} is rejected, it would reveal that group specific regression lines differ in terms of slope and/or intercept. The following syntax has been generated to alter the above analysis to render an unfair outcome.

Syntax

*Executed on the previously created fairness data set to create an unfairness scenario due to differences in the intercept of the regression of salary on jobevaluation.

```
IF (group=1) jobeval = jobeval+50 .
```

```
EXECUTE .
```

```
REGRESSION
```

```
  /MISSING LISTWISE
```

```
  /STATISTICS COEFF OUTS R ANOVA
```

```
  /CRITERIA=PIN(.05) POUT(.10)
```

```
  /NOORIGIN
```

```
  /DEPENDENT salary
```

```
  /METHOD=ENTER jobeval .
```

```
GRAPH
```

```
  /SCATTERPLOT(BIVAR)=jobeval WITH salary BY group
```

```
  /MISSING=LISTWISE .
```

```
FREQUENCIES
```

```
  VARIABLES=salary jobeval /FORMAT=NOTABLE
```

```
  /STATISTICS=STDDEV VARIANCE RANGE MINIMUM MAXIMUM MEAN MEDIAN MODE SKEWNESS
```

```
  SESKEW KURTOSIS SEKURT
```

```
  /ORDER= ANALYSIS .
```

```
SORT CASES BY group .
```

```
SPLIT FILE
```

```
  LAYERED BY group .
```

```
FREQUENCIES
```

```
  VARIABLES=salary jobeval /FORMAT=NOTABLE
```

```
  /STATISTICS=STDDEV VARIANCE RANGE MINIMUM MAXIMUM MEAN MEDIAN MODE SKEWNESS
```

```
  SESKEW KURTOSIS SEKURT
```

```
  /ORDER= ANALYSIS .
```

```
REGRESSION
```

```
  /MISSING LISTWISE
```

```
  /STATISTICS COEFF OUTS R ANOVA
```

```
  /CRITERIA=PIN(.05) POUT(.10)
```

```
  /NOORIGIN
```

```
  /DEPENDENT salary
```

```
  /METHOD=ENTER jobeval
```

```
  /SAVE RESID .
```



```

SPLIT FILE
  OFF.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT salary
  /METHOD=ENTER jobeval
  /SAVE RESID .
GRAPH
  /SCATTERPLOT(BIVAR)=jobeval WITH res_1 BY group
  /MISSING=LISTWISE .
ONEWAY
  res_1 BY group
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS .
COMPUTE Interact = group*jobeval .
EXECUTE .
UNIANOVA
  salary WITH jobeval
  /METHOD = SSTYPE(3)
  /INTERCEPT = INCLUDE
  /CRITERIA = ALPHA(.05)
  /DESIGN = jobeval .
UNIANOVA
  salary WITH jobeval group interact
  /METHOD = SSTYPE(3)
  /INTERCEPT = INCLUDE
  /CRITERIA = ALPHA(.05)
  /DESIGN = jobeval group interact .
UNIANOVA
  salary WITH jobeval group
  /METHOD = SSTYPE(3)
  /INTERCEPT = INCLUDE
  /CRITERIA = ALPHA(.05)
  /DESIGN = jobeval group .

```

Example of Step 1:

To examine compensation fairness salary needs to be regressed on a weighted linear combination of all compensable factors that had been allowed to influence performance worth. In this illustrative case the simplifying assumption was again made that job worth is the only performance worth variable that determines compensation. A plot of salary against the job evaluation score in Figure 14 reveals a linear relationship between the two variables, albeit somewhat less pronounced than in the first example. Differences in the marginal salary and job evaluation distributions are again reflected in the manner in which the observations of the two groups project on the X and Y axes. A larger difference now presents itself in the job evaluation distributions than before.

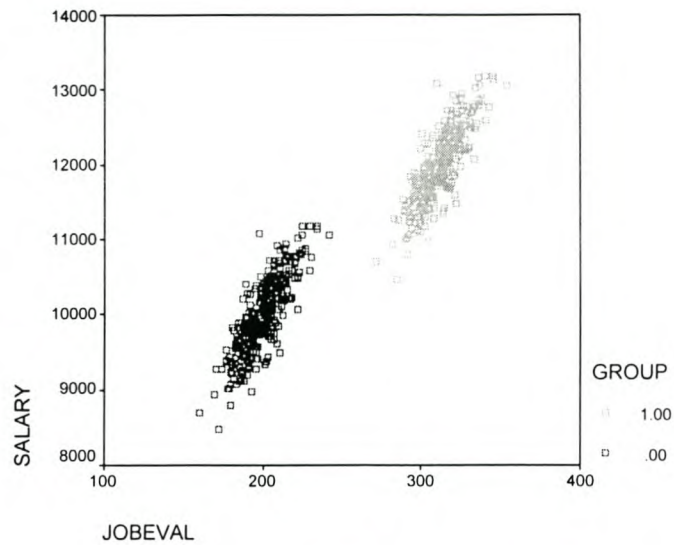


Figure 14: Plot of salary against measure of job worth (alluding to unfairness)

The regression of salary on job evaluation is given in Table 9. Job evaluation ratings still significantly ($p < 0,05$) account for differences in compensation level. Although less than before, a high proportion of the variance in salary (0,908) can still be explained in terms of differences in job evaluation ratings. The question, nonetheless remains whether group membership significantly explains variance in salary that is not explained by differences job evaluation ratings. Figure 13 suggests that the regression of salary on job worth should differ in terms of intercept across the two groups. This in turn suggests that group membership should explain differences in compensation, not explained by differences in job evaluation rating, as a main effect.

Table 9: Regression of salary on the job evaluation score

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	JOBEVAL ^b	.	Enter

a. All requested variables entered.

b. Dependent Variable: SALARY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.953 ^a	.908	.908	339.24098

a. Predictors: (Constant), JOBEVAL

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.81E+08	1	680972634.2	5917.156	.000 ^a
	Residual	68820495	598	115084.439		
	Total	7.50E+08	599			

a. Predictors: (Constant), JOBEVAL

b. Dependent Variable: SALARY

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6254.498	63.299		98.809	.000
	JOBEVAL	18.537	.241	.953	76.923	.000

a. Dependent Variable: SALARY

To determine whether group membership explains additional variance in salary not explained by job worth, the (unstandardized) salary residuals ($Y - E[Y|X]$) were calculated from the regression of salary on job worth (Table 9). These unstandardized residuals were subsequently plotted against job worth as shown in Figure 15.

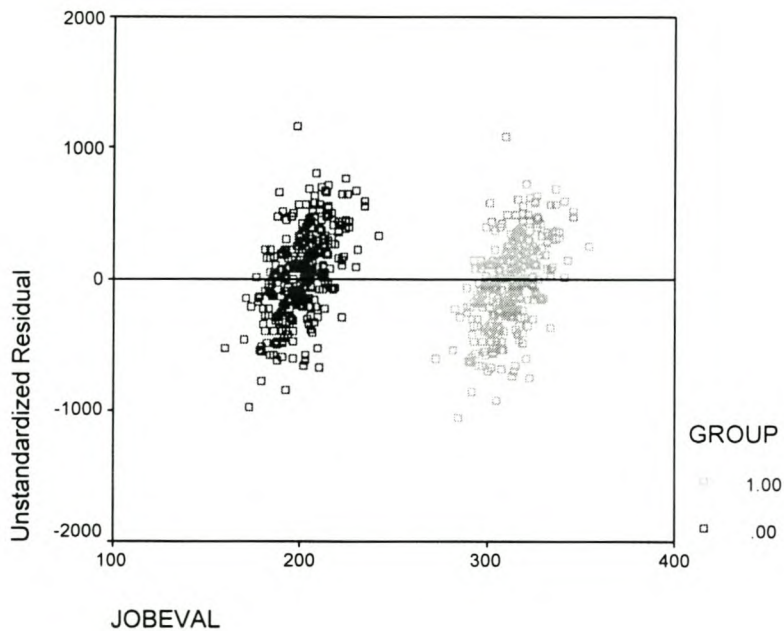


Figure 15: Plot of the unstandardised salary residuals against job evaluation

Visual inspection of Figure 15 seems to suggest that the salary residual distributions of the two groups coincide. It therefore appears as if there are no systematic differences in compensation that cannot be accounted for in terms of differences in job worth but that can be accounted for in terms of differences in group membership. This would in turn suggest that compensation is fair. It needs to be remembered, however, that the graph uses a rather insensitive/coarse scale on the Y-axis and thus could quite possibly mask the differences suggested by Figure 14.

Example of Step 2

To evaluate the qualitative inference made from Figure 15 somewhat more formally the mean unstandardized salary residuals were calculated (Table 10). The significance of the difference in these mean residuals (78,25644) was tested through a oneway analysis of variance (ANOVA). The results of the ANOVA are shown in Table 10. This analysis shows that the differences in the mean residuals are significant [$p < 0,05$]. It therefore indicates that the inference derived from Figure 15 that group does not explain variance in salary not explained by the job evaluation score is incorrect. The difference in the projection of the observations in the two groups on the Y-axis are to subtle to detect in Figure 15.

Table 10: ANOVA comparing Between-Group Residual Means

Descriptives

Unstandardized Residual

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
.00	300	39.12824	336.96928550	19.45493	.8423071	77.4141781	-982.913	1168.735
1.00	300	-39.1282	336.96928550	19.45493	-77.4141781	-8423071	-1061.17	1090.478
Total	600	.0000000	338.95768408	13.83789	-27.1766775	27.1766775	-1061.17	1168.735

ANOVA

Unstandardized Residual

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	918611.6	1	918611.621	8.090	.005
Within Groups	67901883	598	113548.299		
Total	68820495	599			

Example of Step 3

The foregoing conclusion could be verified by formally testing whether group membership significantly explains variance in salary when added to a model already containing job worth as a main

effect and/or in interaction with the job evaluation variable. A moderated regression approach, however, assumes that equal error variances exist across groups. H_{01} , shown below, consequently needs to be tested:

$$H_{01} : \sigma^2[Y | X; \Pi_1] = \sigma^2[Y | X; \Pi_2]$$

$$H_{a1} : \sigma^2[Y | X; \Pi_1] \neq \sigma^2[Y | X; \Pi_2]$$

To obtain the square of the standard error of estimate for each group separately, salary is regressed on job worth within each group. The mean square error of each group against its own regression line are compared to detect for differing distributions.

Table 11: Simple Linear Regression by group

Variables Entered/Removed^b

GROUP	Model	Variables Entered	Variables Removed	Method
.00	1	JOBEVAL ^a	.	Enter
1.00	1	JOBEVAL ^a	.	Enter

a. All requested variables entered.

b. Dependent Variable: SALARY

Model Summary^b

GROUP	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
.00	1	.817 ^a	.667	.666	289.41563
1.00	1	.817 ^a	.667	.666	289.41563

a. Predictors: (Constant), JOBEVAL

b. Dependent Variable: SALARY

ANOVA^b

GROUP	Model		Sum of Squares	df	Mean Square	F	Sig.
.00	1	Regression	49935666	1	49935665.89	596.166	.000 ^a
		Residual	24960899	298	83761.404		
		Total	74896564	299			
1.00	1	Regression	49935666	1	49935665.89	596.166	.000 ^a
		Residual	24960899	298	83761.404		
		Total	74896564	299			

a. Predictors: (Constant), JOBEVAL

b. Dependent Variable: SALARY

Coefficients^a

GROUP	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
.00	1	(Constant)	3557.761	264.608		13.445	.000
		JOBEVAL	32.200	1.319	.817	24.417	.000
1.00	1	(Constant)	1947.781	412.269		4.725	.000
		JOBEVAL	32.200	1.319	.817	24.417	.000

a. Dependent Variable: SALARY

The F-ratio is calculated as the ratio of the mean square errors, (largest over smallest). Using Table 11, F is found to be 1, which falls to the left of F-critical, ($F_{c(298;298)} \approx 1,26$). The first null hypothesis cannot be rejected [$p > 0.05$] and equal error variances can be assumed.

Example of Step 4

The full-saturated model, shown before as equation 8, may be fitted on the data to test H_{02} .

$$H_{02} : \beta_2 = \beta_3 = 0 \mid \beta_1 \neq 0$$

$$H_{a2} : \beta_2 \neq \beta_3 \neq 0 \mid \beta_1 \neq 0$$

Table 12: Linear regression of salary on job evaluation

Tests of Between-Subjects Effects

Dependent Variable: SALARY

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	680972634 ^a	1	680972634.2	5917.156	.000
Intercept	1123590019	1	1123590019	9763.179	.000
JOBEVAL	680972634	1	680972634.2	5917.156	.000
Error	68820494.6	598	115084.439		
Total	7.342E+10	600			
Corrected Total	749793129	599			

a. R Squared = .908 (Adjusted R Squared = .908)

Table 13: Moderated linear regression of salary on job evaluation, group and job evaluation * group interaction**Tests of Between-Subjects Effects**

Dependent Variable: SALARY

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	699871332 ^a	3	233290443.9	2785.178	.000
Intercept	15142248.5	1	15142248.48	180.778	.000
JOBEVAL	49935665.9	1	49935665.89	596.166	.000
GROUP	904697.804	1	904697.804	10.801	.001
INTERACT	.000	1	.000	.000	1.000
Error	49921797.0	596	83761.404		
Total	7.342E+10	600			
Corrected Total	749793129	599			

a. R Squared = .933 (Adjusted R Squared = .933)

$$H_{02} : \beta_2 = \beta_3 = 0 \mid \beta_1 \neq 0$$

$$H_{a2} : \beta_2 \neq \beta_3 \neq 0 \mid \beta_1 \neq 0$$

H_{02} is tested by calculating $F = \{(SSR[b_1, b_2, b_3] - SSR[b_1]) / [p - 1]\} / MSE[b_1, b_2, b_3]$

where $F \sim F[p - 1, n - p - 1]$ and p represents the number of effects in the saturated model (in this example, $p = 3$). Using the analysis shown in Tables 12 and 13, F is calculated as 113 ($[(699871332 - 680972643) / 2] / 83621.101$), which is greater than F -critical, ($F_{c(2;596)} \approx 3.02$) and therefore H_{02} can be rejected. It is now possible to conclude that the regression equation of groups π_1 and π_2 do differ either in slope and intercept, and the compensation level is affected by group membership.

Example of Step 5

As set out in Chapter 2 above, the procedure now tests H_{03} to determine whether the group membership*performance worth interaction term significantly explains variance in compensation in a model that already contains the performance worth and group membership main effects.

$$H_{03} : \beta_3 = 0 \mid \beta_1 \neq 0; \beta_2 \neq 0$$

$$H_{a3} : \beta_3 \neq 0 \mid \beta_1 \neq 0; \beta_2 \neq 0$$

H_{03} is tested similar to H_{02} , by calculating the F ratio expressed above as equation 10. F is calculated using the analysis shown in Table 13 (or if calculated by hand Tables 13 and 14), as 0 ($[(699871332 - 699871332) / 1] / 83761.404$), which is less than F -critical, ($F_{c(1;596)} \approx 3.02$) and therefore H_{03} fails to be rejected.

Table 14: Moderated linear regression of salary on job evaluation and group

Tests of Between-Subjects Effects

Dependent Variable: SALARY

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	699871332 ^a	2	349935665.9	4184.777	.000
Intercept	30164213.0	1	30164213.01	360.725	.000
JOBEVAL	99871331.8	1	99871331.79	1194.332	.000
GROUP	18898697.6	1	18898697.60	226.004	.000
Error	49921797.0	597	83621.101		
Total	7.342E+10	600			
Corrected Total	749793129	599			

a. R Squared = .933 (Adjusted R Squared = .933)

This would imply parallel regression lines for each subgroup, which differ in, intercept only. The interaction term is therefore removed from the saturated model. The interaction between job worth and group membership does not explain unique variance in compensation.

Example of Step 6

H_{04} is then tested to determine whether group membership explains unique variance in salary when added to a model than already contains the job evaluation score. Strictly speaking this is not necessary since the rejection of H_{02} and the failure to reject H_{03} logically suggests that H_{04} must be rejected. The requisite F-ratio is calculated as $223 [(699871332-680972634)/1] / 83621.101$ which is greater than F-critical, $(F_{c(1;596)} \approx 3,02)$ and therefore H_{04} can be rejected. Should H_{03} have been rejected, a further hypothesis test would be required as described in section 2.5.2.4. In this example, the researcher is able to conclude that group specific regression lines, differ by intercept only. The parameter estimate for the group main effect shown in Table 15 would suggest that one possible remedy is to adjust the salary levels for all members of group 1 (Π_2) should be increased by R1609,98.

Table 5: Moderated linear regression of salary on job evaluation and group

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.966 ^a	.933	.933	289.17313

a. Predictors: (Constant), GROUP, JOBEVAL

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.00E+08	2	349935665.9	4184.777	.000 ^a
	Residual	49921797	597	83621.101		
	Total	7.50E+08	599			

a. Predictors: (Constant), GROUP, JOBEVAL

b. Dependent Variable: SALARY

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3557.761	187.322		18.993	.000
	JOBEVAL	32.200	.932	1.655	34.559	.000
	GROUP	-1609.979	107.093	-.720	-15.033	.000

a. Dependent Variable: SALARY

Figure 16 depicting the regression of the adjusted salary on job worth suggests that the adjustment had the effect of removing the unfairness from the compensation system. This argument, however, presupposes a linear relation between worth and compensation and it presupposes no measurement bias in job worth.

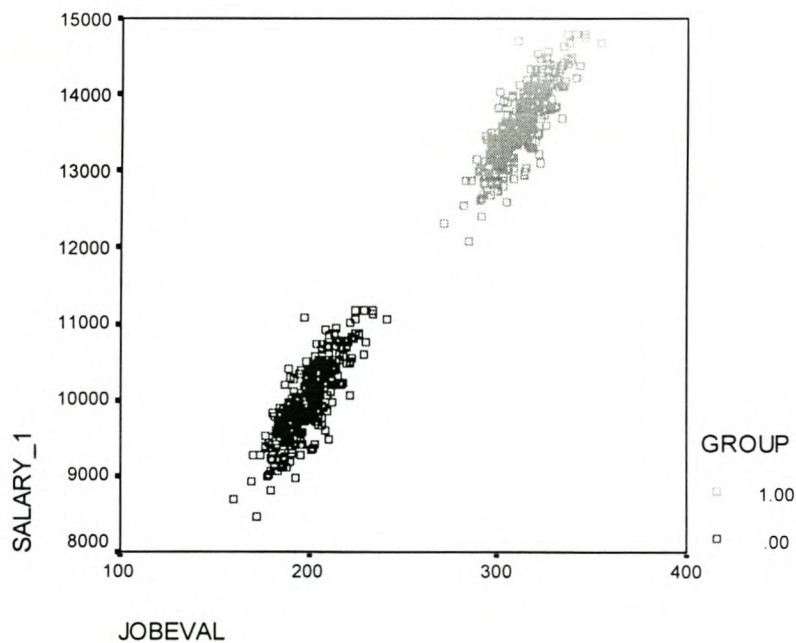


Figure 16: Plot of adjusted salary against a measure of job worth

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"I hate quotations. Tell me what you know."

Ralph Waldo Emerson

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